THE PAPER INDUSTRY

CHNOLOGY DEPT.

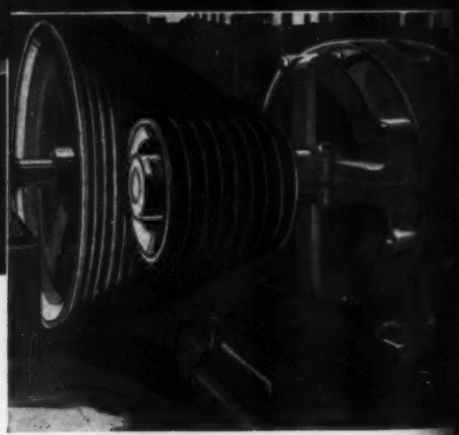
and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—JULY, 1943

tributed by the DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

ROCKWOOD automatic belt tightening MOTOR BASE

FOR USE WITH FLAT BELTS OR V-BELTS



BELT DRIVES DO BETTER WORK WITH AUTOMATIC BELT TIGHTENING

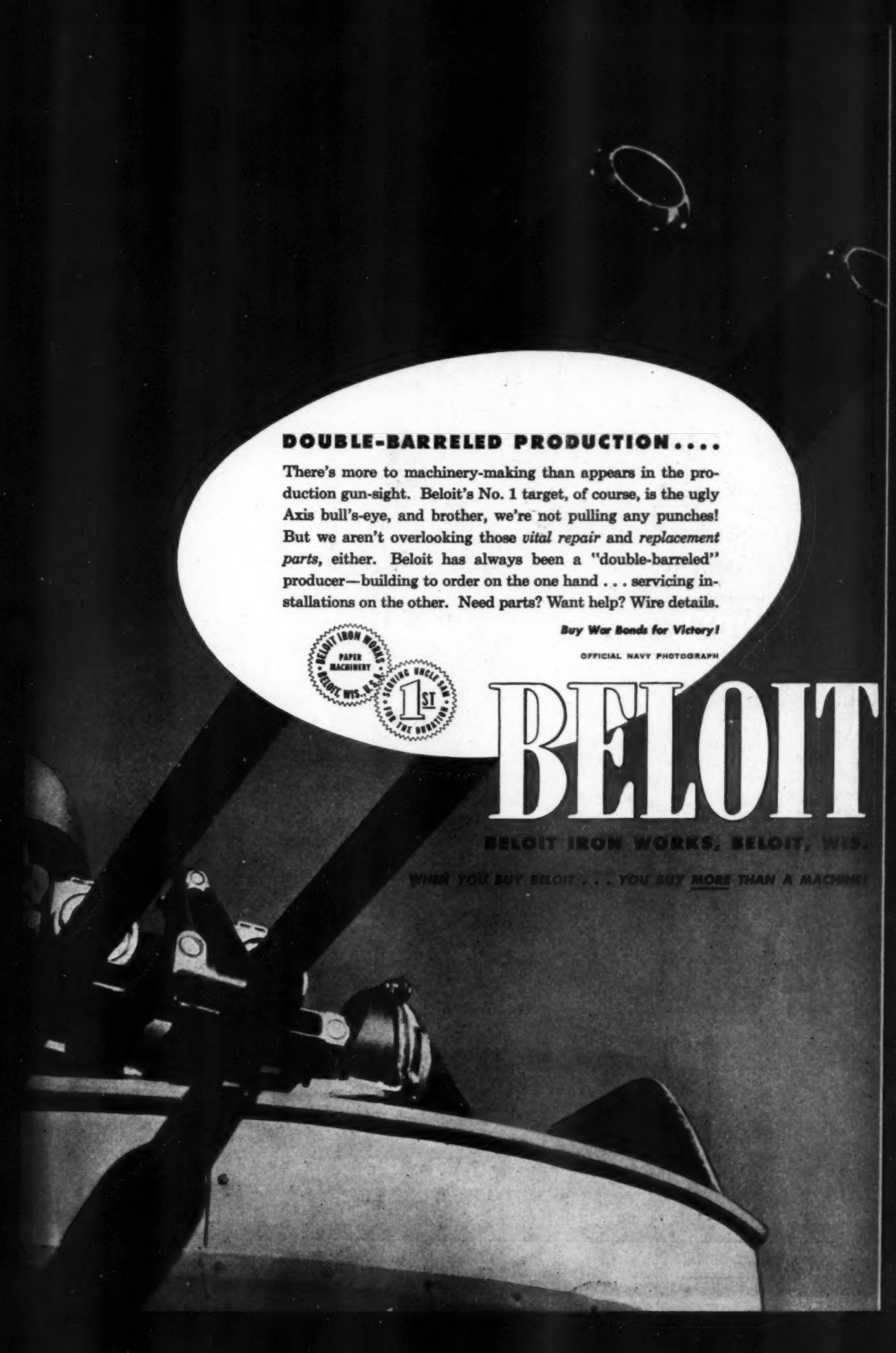
Algonquin Paper Corporation of Ogdensburg, N. Y., have this 100 h.p. Rockwood Drive to vacuum pump attached to paper machine. The pivoted base takes up belt stretch and the belt tightness is automatically matched to each load change. As a result the vacuum pump performs better and has more capacity. *And* the belt life is practically doubled as belt slip is almost entirely eliminated.

In most paper mills where one or more Rockwood automatic belt tightening motor bases are installed on trial the Rockwood motor base soon becomes accepted mill practice. Never before has a belt drive from electric motor to driven machine been so soundly engineered. Hundreds of paper mill engineers install them regularly. Call in your nearby Rockwood dealer or write us about your drives.

V-belt drives need automatic belt tightening the same as do flat belts—for all V-belts stretch under load and then slip. With Rockwood automatic belt tightening bases the V-belt life is ordinarily doubled.

ROCKWOOD
INDIANAPOLIS • U.S.A.
Specialists in Power Transmission Equipment Since 1884

Rockwood distributors carry stocks of automatic belt tightening motor bases, Rockwood paper pulleys and Rockwood V-belts and sheaves. YOU CAN GET DELIVERY OF ANY ROCKWOOD STOCK POWER DRIVE PRODUCT PROMPTLY. See your nearest Rockwood distributor.


DOUBLE-BARRELED PRODUCTION....
There's more to machinery-making than appears in the production gun-sight. Beloit's No. 1 target, of course, is the ugly Axis bull's-eye, and brother, we're not pulling any punches! But we aren't overlooking those *vital repair* and *replacement parts*, either. Beloit has always been a "double-barreled" producer—building to order on the one hand . . . servicing installations on the other. Need parts? Want help? Wire details.
Buy War Bonds for Victory!
OFFICIAL NAVY PHOTOGRAPH
BELOIT IRON WORKS
PAPER MACHINERY
BELOIT, WIS., U.S.A.
SERVING UNCLE SAM
1ST
FOR THE DURATION
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WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

Two "AUTOMATICS"

HANDLE MORE THAN A HUNDRED TONS OF BOX BOARD STOCK DAILY

"We are mighty thankful that we had the foresight to obtain two "AUTOMATIC" LIFT TRUCKS prior to the war," states John Gautzer, the F. N. Burt traffic manager. "These trucks are in constant service and have stood up to the increased demands we have put on them remarkably well."

● The F. N. Burt Co. manufactures paper containers. The chief duty of the two "AUTOMATICS" is to transport the incoming boxboard stock as required throughout the six story plant and they are also used to move a large amount of inter-department material.

These two "AUTOMATICS" are daily transported by street truck to the warehouse one-half mile away from plant where incoming boxboard is unloaded and stored. One of the "AUTOMATICS" has been in service for more than five years, the other for two years. Both trucks traverse several ramps along the traffic lanes which always calls for a surplus of reserve power.

"AUTOMATIC" representatives, fully experienced in the application of industrial trucks, will co-operate with you. These men are listed in the classified telephone directories in principal cities and industrial areas under "TRUCKS, INDUSTRIAL."

MANUFACTURERS FOR OVER 25 YEARS *Electric Propelled* INDUSTRIAL TRUCKS

AUTOMATIC TRANSPORTATION CO.

DIV. OF THE YALE & TOWNE MFG. CO.

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PLAYING an important part in the Nation's food program by protecting seedlings from direct sunlight, frost, etc., these "tents" for plants are an interesting wartime use of *paper*.

In producing the infinite variety of paper and paper products needed to meet today's wartime and civilian demands, paper mill operators everywhere are assuring maximum output . . . by lubricating their equipment with *Texaco*.

Texaco Ursa Oil in the circulating systems of dryers and calenders keeps bearings cool. Resisting breakdown and sludging, it assures a full supply of clean oil to all bearings.

So effective have Texaco lubricants proved that they are definitely preferred in many important fields, a few of which are listed in the panel.

A Texaco Lubrication Engineer will gladly cooperate in the selection of the most suitable lubricants for your plant. Just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write to:

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The Texas Company, 135 East 42nd Street, New York, N. Y.

THEY PREFER TEXACO

★ More buses, more bus lines and more bus-miles are lubricated and fueled with Texaco than with any other brand.

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TEXACO Lubricants

FOR THE PAPER INDUSTRY

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

BEST DRESSED MEN IN THE WORLD

YOU don't need any introduction to these men – they're your sons, your brothers, your neighbors' boys. Fighting for you – for America – with the finest equipment and materials America can give them. That includes both equipment you see and equipment you don't see.

Take their uniforms, for instance – and their blankets, tents and parachutes. Millions of units of sturdy textiles are needed to equip our armed forces. Thousands of tons of chlorine are used in bleaching these materials – that's where a big supply of Mathieson chlorine goes.

And their planes, tanks and munitions – the best that America can supply. Mathieson Chemicals fill many a vital need in their manufacture. Mathieson chlorine helps in the production of warplane cowlings, high octane gasoline, explosives, cooling agents for liquid-cooled engines, and certain types of synthetic rubber. Mathieson soda ash is required in the making of explosives, aluminum, iron, steel and war-essential glass. Other war needs consume large amounts of Mathieson caustic soda, ammonia and carbon dioxide.

Sanitation materials are another important item. Great quantities of Mathieson HTH are going out to help assure our troops of pure drinking water – overseas – on shipboard – in training camps.

The best is none too good for our fighting men – and we here at The Mathieson Alkali Works are making an all-out effort to help give it to them. We're all in this war together – we all want to help America win!

Mathieson CHEMICALS

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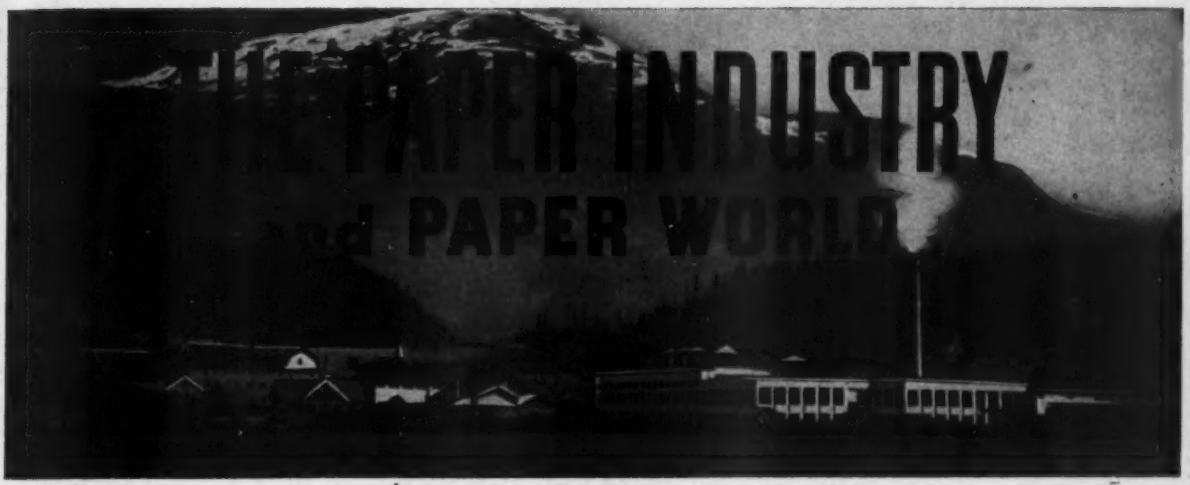

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for the attention of

PULP MILL EXECUTIVES

$100,000 Cash Gift And 500-Acre Site

NEIL COONEY, pioneer Grays Harbor lumberman, died May 8 bequeathing $100,000 and one of the finest water front sites on the Pacific Coast to establish a pulp mill in Cosmopolis where he made his fortune. This advertisement is published by the business men of Aberdeen to assist their neighboring city in securing the permanent industry Mr. Cooney envisioned.

- ***Perpetual Wood Supply***
- ***Industrial Water***
- ***Deep-Water Port***
- ***Three Railroads***
- ***Community of 30,000***
- ***Non-Critical Area***
- ***Housing Surplus***
- ***Friendly Labor***

Cosmopolis is near the head of tidewater on Grays Harbor, Pacific Coast port strategically located for inter-coastal or trans-Pacific shipping. It is backed by vast pulp-species forests insuring perpetual wood supply.

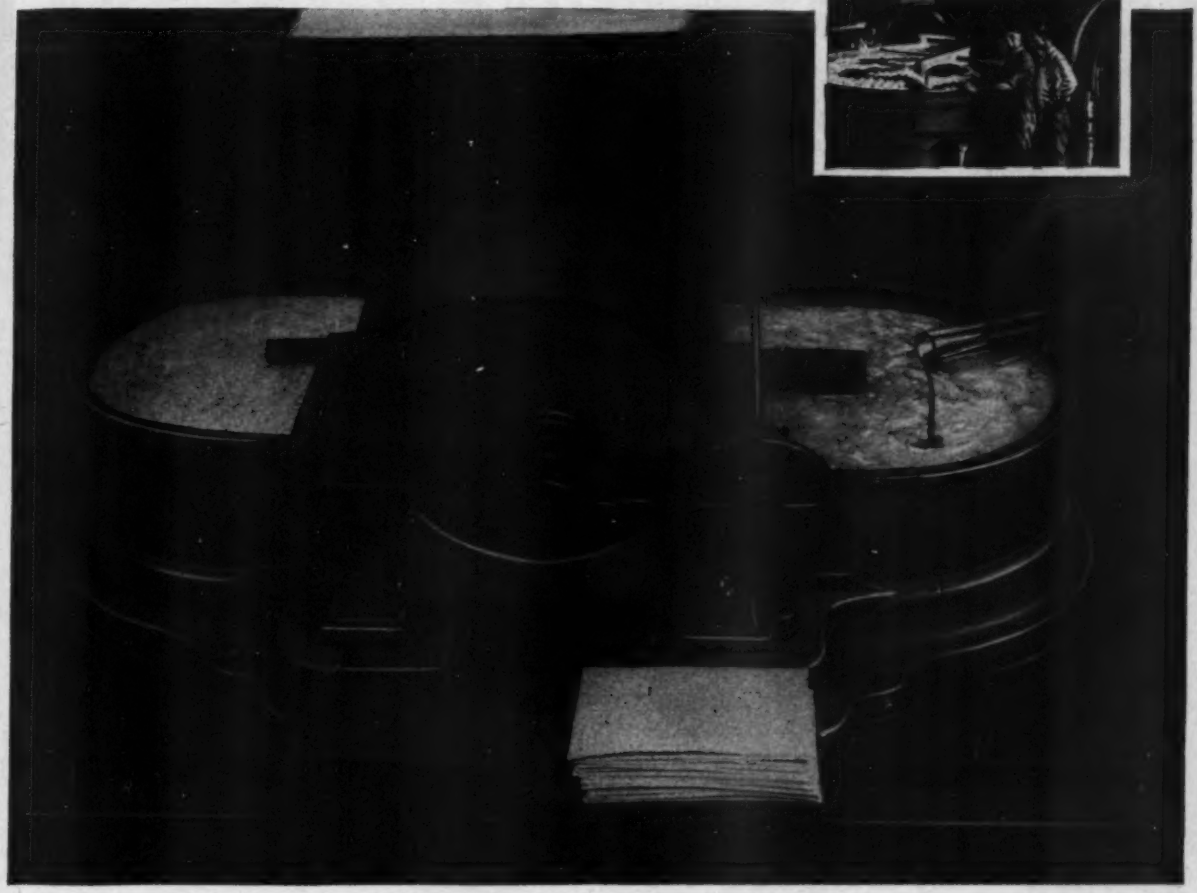
Aberdeen, Cosmopolis and Hoquiam, with common boundary lines, form an industrial community of 30,000 where pulp, paper, plywood, lumber and manufactured lumber products are produced by friendly labor, under responsible leadership, for the markets of the world.

Wire, telephone or write for full details of the Neil Cooney bequest to R. M. Landberg, Manager, National Bank of Commerce, Aberdeen, Washington, or to F. W. Linklater, Manager, Aberdeen Chamber of Commerce.

ABERDEEN CHAMBER OF COMMERCE

Aberdeen - - - - Washington

NO. 3 OF A SERIES... *The Dollars and Sense of H. & M. Developed Formulas*



UNIFORMITY THROUGH CONTROL OF FURNISH

FROM LONG EXPERIENCE, everybody in the paper business knows the sales value of a uniform sheet of paper. Uniform as to color, surface and body formation.

However, it stands to reason that raw material variations will greatly influence this uniformity. Recognizing this factor, H & M. has long since established close control over the materials used in the manufacture of colors and has carefully standardized the colors themselves.

But color standardization by itself will not produce uniformity in papers. Today, there is more than the usual variation in furnish to be considered. Color reformulation, of course, can do much to minimize variations in furnish. And this can often be taken care of at the mill. A valuable guide, however, can be worked out for you in our laboratories. It is there that the relationship between furnish, fillers and colors can be most economically and successfully investigated. The building and revision of furnish and color formulation are an outstanding part of H. & M. Technical Service.

For general applications, of course, mill superintendents use the H. & M. shade card, "Colors for Paper," as a *standard* desk reference. But if you have a special problem, your H. & M. representative will be glad to see that our laboratories handle it for you.

HELLER & MERZ DEPARTMENT

CALCO CHEMICAL DIVISION • AMERICAN CYANAMID COMPANY

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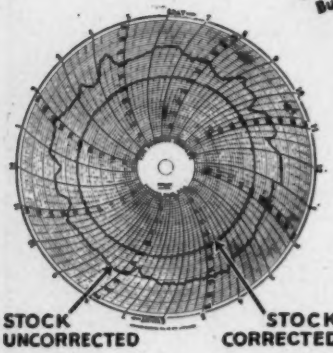
MACHINES OF MERIT

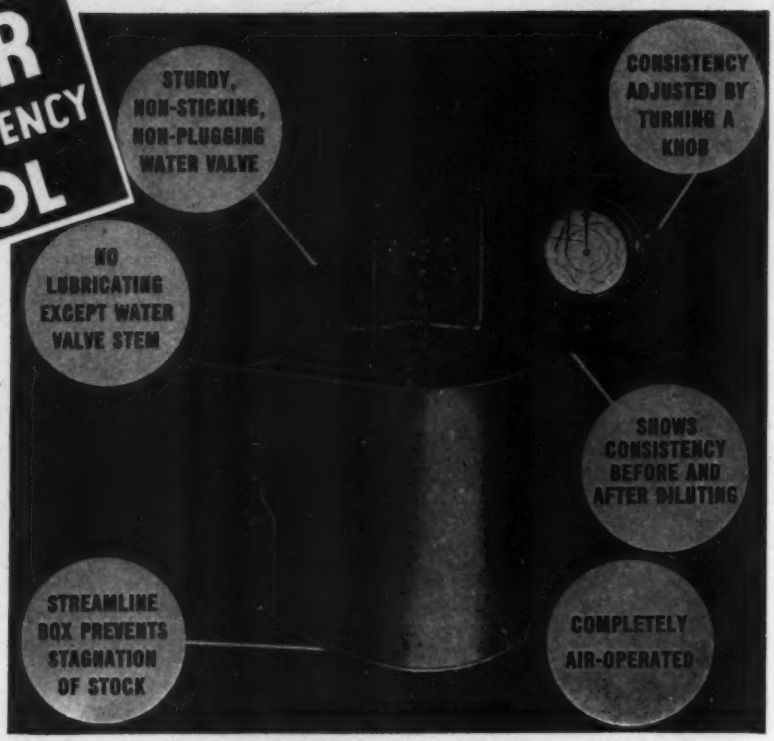
BRAMMER RECORDING CONSISTENCY CONTROL

Licensed Under U. S. Patent Numbers: 2,302,326-2,302,327
Other Patents Pending

Write for BRAMMER Bulletin



STOCK UNCORRECTED — STOCK CORRECTED


STURDY, NON-STICKING, NON-PLUGGING WATER VALVE
CONSISTENCY ADJUSTED BY TURNING A KNOB
NO LUBRICATING EXCEPT WATER VALVE STEM
SHOWS CONSISTENCY BEFORE AND AFTER DILUTING
STREAMLINE BOX PREVENTS STAGNATION OF STOCK
COMPLETELY AIR-OPERATED

The ROLL-O-FINER

ADVANTAGES: Continuous beating. Positive feeding. High consistencies. Uniform circulation. Controllable pressure. Uniform beating. Efficient treatment. High capacity. Low power. Compact, rugged design. Bedplate accessibility.

MEXICAN-BUILT for delivery if priorities are not procurable. UNITED STATES-BUILT if priorities are procurable.

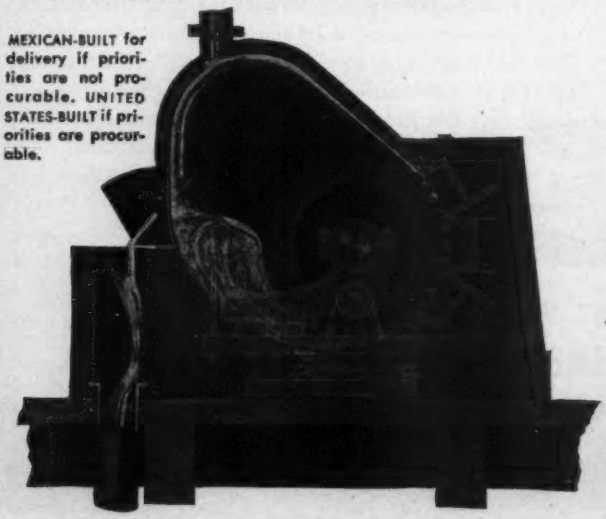
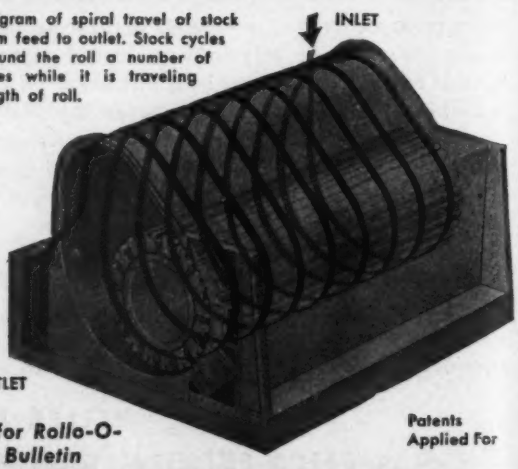


Diagram of spiral travel of stock from feed to outlet. Stock cycles around the roll a number of times while it is traveling length of roll.



Ask for Rollo-O-Finer Bulletin

Patents Applied For

PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

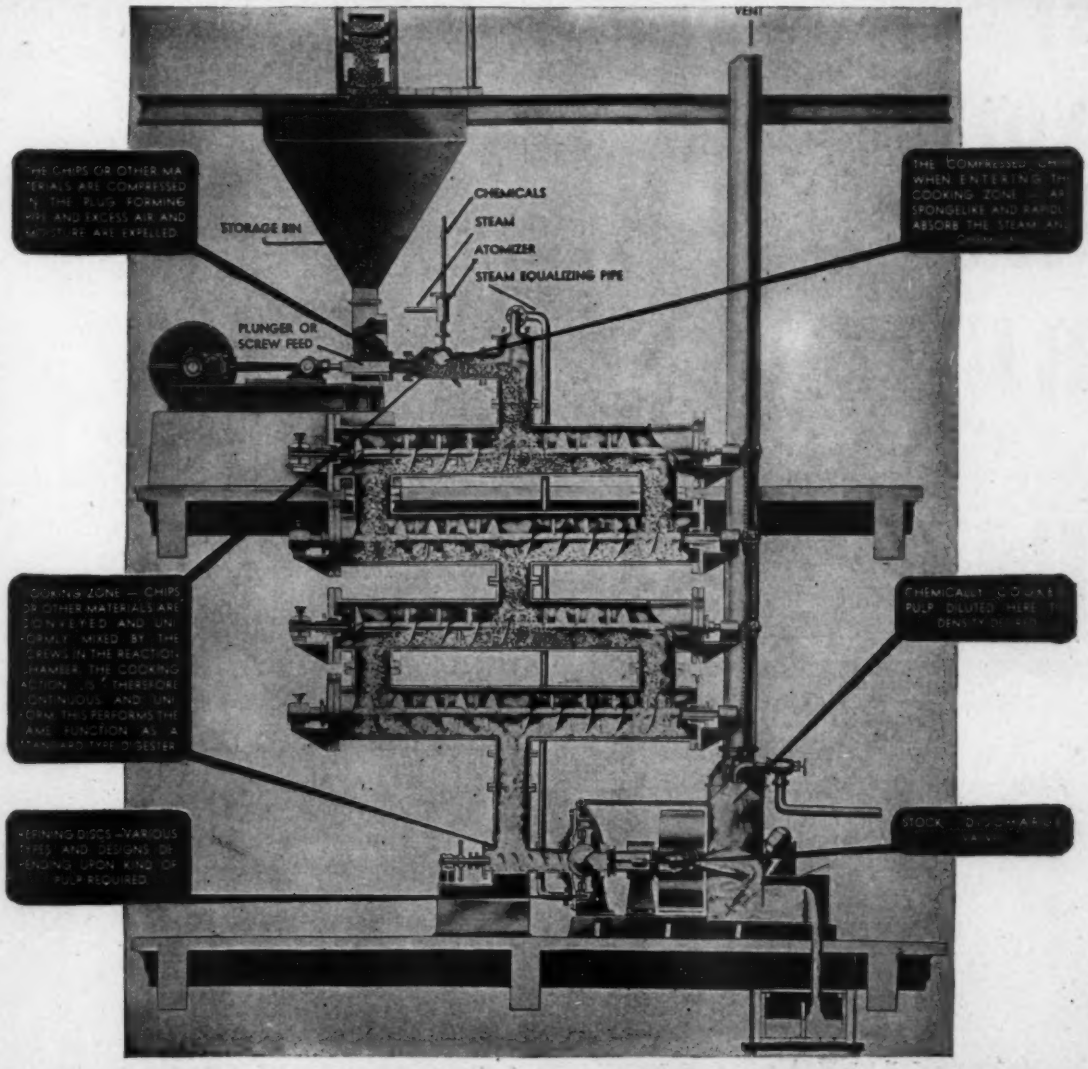
The CHEMIPULPER

combining the ASPLUND DEFIBRATOR

and B-K REACTION CHAMBER

(PATENTED AND PATENTS PENDING)

THE MODERN PULP MAKER



WE ARE NOW SOLICITING ORDERS AND MAKING ARRANGEMENTS FOR POST-WAR DELIVERY. . . . To prepare now for the day when peace brings a sudden stop to war production is engaging the minds of many progressive mill executives. Planning ahead for tomorrow's needs is one of the best means of keeping abreast of the times. That is why we are ready now to confer with you regarding your post-war requirements . . . and to arrange for peace-time delivery. . . . . Catalogs upon request.

INVESTIGATE OUR NEW SCREW FEED FOR STRAW PULPS, ETC.

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Incorporated
122 East 42nd Street, New York, N. Y.

CRODON PLATING pays

IF YOU CAN'T REPLACE • • • RENEW!

CRODON
The Chrome Plate

FULL-TIME emergency operations shorten the normal useful life of machinery and equipment. Necessary replacements are frequently unavailable, but essential production MUST continue without interruption.

Industrial CRODON-plating provides new-equipment performance. It avoids the use of scarce metals for *entire* machines or parts. It shortens replacement time and reduces production losses due to worn-out equipment. There is substantial economy in restoring worn parts by industrial chrome plating, as well as a material saving in the consumption of strategic metals. CRODON is useful in rebuilding parts that are undersized due to errors in machining.

CRODON plate re-surfaces worn parts with an extremely hard, smooth, long-wearing, corrosion-resistant protective coating. It may be finished to exact tolerances. It is available to essential industries as a proven method of repair and maintenance—more than ever useful on new equipment for dependable operation. Behind every CRODON application are the resources, experience and reputation of America's oldest and largest industrial chromium plating organization.

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EXECUTIVE OFFICES—120 BROADWAY, NEW YORK

346 Huntingdon Avenue
Waterbury, Conn.

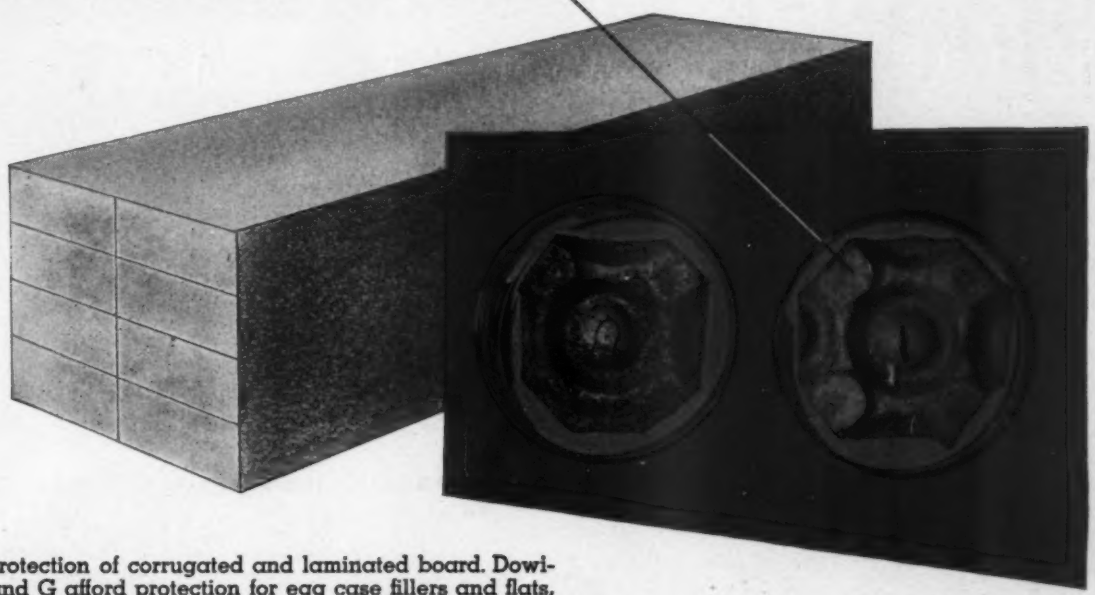
1760 Lakeview Road
Cleveland, Ohio

4645 West Chicago Avenue
Chicago, Ill.

How to make paper products mold-resistant!

Paper products susceptible to mold growth—such as egg case fillers and flats and soap wrappers—are effectively made mold-resistant with Dowicide. Numerous other paper products, especially those used for wrapping or packaging materials having high moisture content, are also given this needed protection against damaging fungous growths.

Dowicide products most widely used by the paper industry are Dowicides G, B, A and 1. Dowicide G finds application



in the protection of corrugated and laminated board. Dowicide B and G afford protection for egg case fillers and flats, soap wrappers, and similar products. Dowicide A offers protection for specialty products, such as gummed tape. Dowicide 1 is used to prevent mold growth on waxed outer wrappers.

Seventeen Dowicide products are manufactured by The Dow Chemical Company . . . each one designed to do a specific job in combating fungi and bacteria. They are easy to apply —economical and effective to use. For more complete information on mold-resistant paper products request Dowicide technical bulletin No. 45.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle

OTHER USES FOR DOWICIDES: Preventing stain and decay on pulp logs; preserving lap and pulp stock; lengthening felt life and lowering production costs; protecting paper products from decay and termite attack; controlling slime conditions; reducing structural and paint maintenance costs.

DOWICIDE

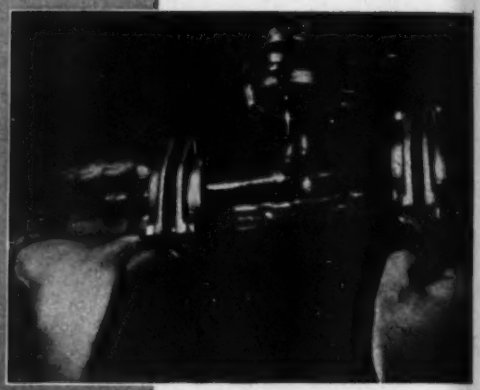
GERMICIDES AND FUNGICIDES

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

Users of Pyrex Piping say

"BREAKAGE IS NOT A PROBLEM"



Corning can give you scientific data about the toughness of PYREX brand Glass Piping, its mechanical strength, degree of hardness, and so on. But the only effective answer to the breakage bugaboo comes from actual users—and in a recent survey not one user was found who would admit that breakage is a problem.

Here are three typical answers to the question: "Are you troubled by breakage?"

ABSOLUTELY NO BREAKAGE PROBLEM

"We've used PYREX brand Glass Piping for fifteen years—use thousands of feet of the 2-inch size to carry heavy syrups. Though only one small section which runs alongside a loading platform is protected by a metal guard, we have absolutely no trouble with breakage."

"We have about 600 feet of 1½" PYREX Piping in our bottling department. We installed it three years ago and have had no breakage. If a length were broken occasionally, it would mean nothing compared to the value to us of the visibility and purity features."

CAREFUL HANDLING IS INSTINCTIVE

"We started using PYREX Piping in 1937 and never think about the chance of its being broken. Our men know glass when they see it and are governed accordingly. Breakage is much more likely to be a problem with a piping material such as ————————."

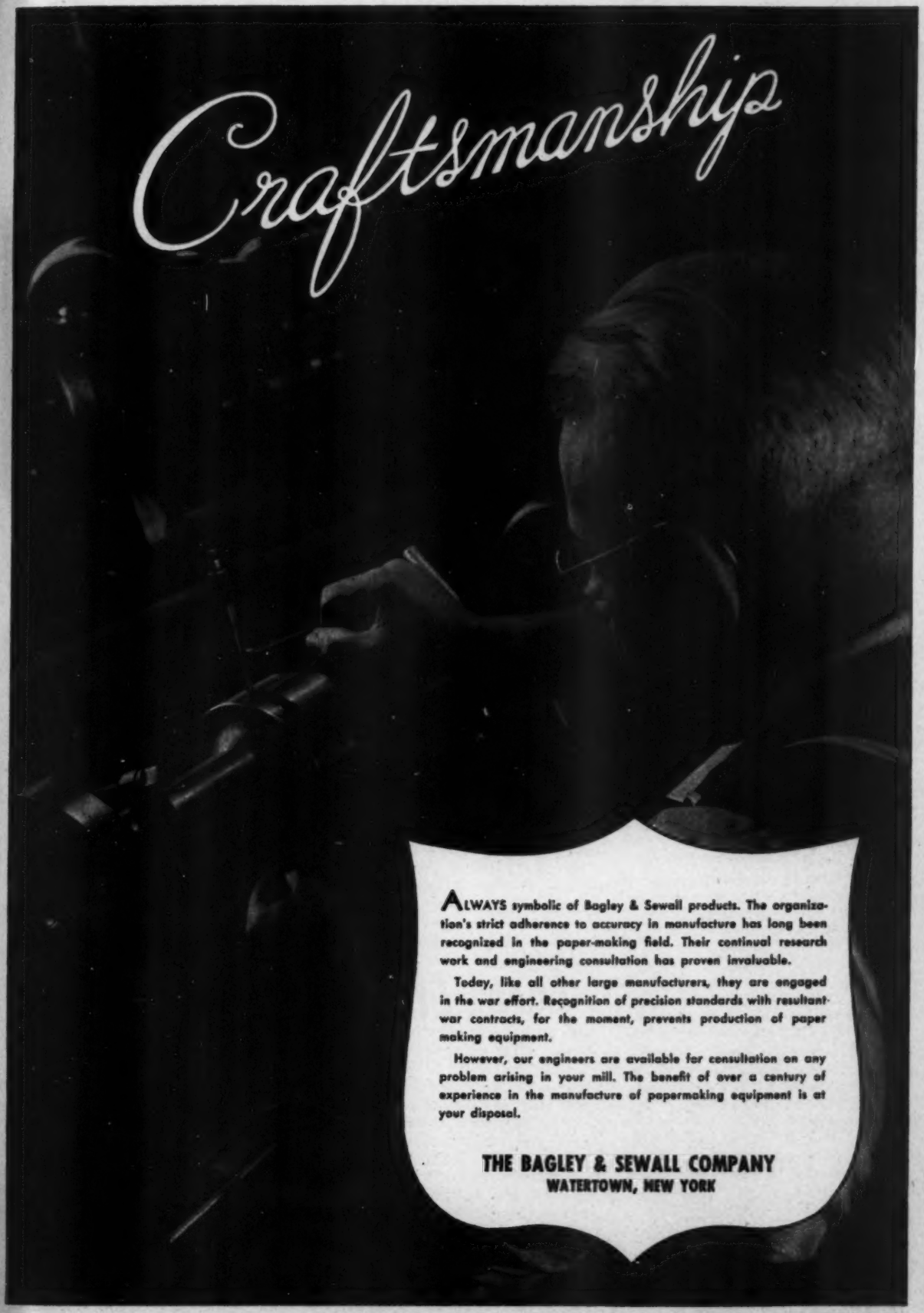
AVAILABLE NOW

The truth is that even in the most rough and ready plants, workmen recognize glass and almost automatically handle it with the necessary care. Corrosion-resistant to all acids (except HF) PYREX brand Glass Piping does not deteriorate and may be considered a permanent investment. Its visibility, ease of cleaning, and perfectly smooth surface are factors that merit your serious consideration. PYREX Piping has a full line of accessories including all usual elbows and joints. What's more, it is available today.

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

CORNING Glass Works Corning, New York

Pyrex Industrial Glass



ALWAYS symbolic of Bagley & Sewall products. The organization's strict adherence to accuracy in manufacture has long been recognized in the paper-making field. Their continual research work and engineering consultation has proven invaluable.

Today, like all other large manufacturers, they are engaged in the war effort. Recognition of precision standards with resultant war contracts, for the moment, prevents production of paper making equipment.

However, our engineers are available for consultation on any problem arising in your mill. The benefit of over a century of experience in the manufacture of papermaking equipment is at your disposal.

THE BAGLEY & SEWALL COMPANY
WATERTOWN, NEW YORK

AXES

for the AXIS

This page reproduced through the courtesy of The Champion Paper and Fibre Company.

TRADE WINDS

WPB Will Control All Wood Pulp

▶▶▶ THE WAR PRODUCTION BOARD announced on June 29 that effective as of that date it had assumed control over the use of all grades of wood pulp. Actual allocations under this new order are to start August 1.

This latest action was taken, the WPB stated, because the demand for wood pulp is exceeding the supply, and it is felt that a shortage of pulp for military and essential civilian uses is impending.

Under this newly amended General Preference Order M-93, various grades of wood pulp will be allocated to specific manufacturers who will be told the amount and kinds of paper, paperboard, and other products they may manufacture. It is probable that the use of wood pulp for less essential papers will be restricted or eliminated.

Effective July 1, users of pulp are required to apply to WPB before the fifth of each month for authority to use certain quantities of wood pulp for stated uses during the following month. Likewise, pulp producers must file by the 12th of each month schedules showing proposed shipments for the coming month. No producer may ship more than one ton of any grade of pulp in one month without permission from the WPB. The first allocations of pulp for the month of August will be prepared at the next meeting of WPB's wood pulp allocation committee on July 19.

The new restrictions cover pulp supplies for the manufacture of newsprint in the United States. Officials of the WPB stated that a further cut in newsprint supplies starting October 1 is a distinct possibility because of the scarcity of pulp. This proposed cut would be in addition to the cut of approximately 5 per cent which became effective July 1. The first cut imposed on newsprint was a 10 per cent reduction which became effective January 1, this year.

From time to time the list of priorities, price and freezing directives affecting the industry has been increasing. However, the following resumé summarizes the restriction and allocation of wood pulp since May, 1942:

Effective May 1, 1942, General Preference Order M-93 provided for the complete allocation of all wood pulp. The allocations were prepared by the Pulp and Paper Branch of the WPB under the advisement of the Pulp Allocation Board, made up of 13 representatives of the industry.

General Preference Order M-93 (a) issued May 4, 1943, required pulp producers to withhold 20 per cent of all pulp produced during June and subsequent months, and that deliveries of this withheld amount could be made only on order from the WPB.

Order M-251, issued October 23, 1942, restricted operation of pulp mills in the Puget Sound area. The order became effective November 1, 1942 and called for the withholding of logs from, and restricted deliveries of pulp by the Tacoma (Wash.) mill of St. Regis Paper Company, the Anacortes (Wash.) mill of Scott Paper Company, and the Tacoma (Wash.) mill of Rayonier, Inc.*

The following release giving new wood pulp allocations, was issued by the WPB on April 2, 1943, and was published in the April, 1943 issue of THE PAPER INDUSTRY AND PAPER WORLD:

▶▶▶ The increasing shortage of certain grades of wood pulp necessitates a more general use of groundwood, newsgrade unbleached sulphite, de-inked waste fiber and other waste papers in paper and paperboard manufacturing, the WPB Pulp and Paper Division stated today in connection with the April wood pulp allocations.

The attention of the Wood Pulp Allocation Industry Advisory Committee was focused on this problem during its March meeting held in Washington.

The summary of wood pulp allocations for April follows:

Bleached Sulphite: The supply of bleached sulphite continued short relative to current consumption. Allocations of market pulp were again on the basis of a 30-day inventory in the hands of non-integrated mills. As de-inking plants are currently operating at less than capacity, their operations must be raised wherever possible. If bleached sulphite consumption continues at the present level, future allocations may have to be curtailed below 30 days and other grades of pulp substituted for the deficiency.

Strong Unbleached Sulphite: Strong unbleached sulphite was allocated on the basis of a 45-day inventory. The supply situation in this grade will, of course, be effected if it is substituted for bleached sulphite to meet future shortages.

Newsgrade Unbleached Sulphite: This grade is in relatively ample supply. Its increased use is urged as a means of conserving the better grade pulps.

Bleached Sulphate: Allocations of this grade were made to provide consumers with roughly a 30-day inventory. The supply of northern grades is relatively scarcer than the southern but shortages are serious in both.

Unbleached Sulphate: Allocations were on a 30-day basis in both the northern

(*) As a result of this restriction, the plant of Rayonier, Inc., at Tacoma, was shut down during the month of November, 1942. In June, 1943, this plant was sold to Bagley and Sewall Company, (Cf. THE PAPER INDUSTRY AND PAPER WORLD, June 1943, page 238.)

and southern grades. The market supply of southern kraft continues to be restricted by shortages of pulpwood and increased requirements for container board.

Soda: It was only possible to allocate enough to maintain an estimated 30-day inventory as of April 30 in this grade. Consumption will have to be curtailed if inventories are to be maintained at this level.

Groundwood: This grade, like newsgrade sulphite, is easier than most others. Some consumers are already introducing groundwood into papers where it was formerly not used and increased groundwood consumption is necessary to relieve the shortage in other grades.

◆

WAR PRISONERS MAY BE USED TO GET OUT PULPWOOD

Due to the shortage of manpower in the woods, the use of prisoners of war for this work is receiving serious consideration by the industry with the full co-operation of the Army. The American Paper and Pulp Association reports that some progress is being made.

There are, of course, certain obstacles to be overcome, but there seems to be no discrimination against using these prisoners for pulpwood procurement if proper means of guarding them can be worked out.

It is understood the War Department has approximately 150,000 prisoners in this country at present. Fifty-eight military prison camps are already built and others are reported in course of construction.

The American Paper and Pulp Association is following the matter closely, and it is suggested that pulpwood operators in the vicinity of the camps investigate the possibilities with local Army officers and the United States Employment Service Offices. A list of the camps may be obtained from the APPA.

◆

CAN. NEWSPRINT DELIVERIES TO U. S. CUT 13% FOR JULY

Canadian newsprint manufacturers were ordered by Guy E. Hoult, newsprint administrator of the Wartime Prices and Trade Board of Canada, to make a cut of at least 13 per cent in shipments on orders from United States newspaper publishers for July delivery, so as to bring deliveries on the orders, which total 240,000 tons, into line with the 210,000 tons a month which Canada undertook to supply the United States during the third quarter of this year. The agreement was reached between both countries because of the restrictions on Canadian output arising from shortages of power, labor, and wood for pulping.

A straight cut of 13 per cent on all orders would bring total shipments down to less than 209,000 tons, but a statement from Mr. Hoult's office points out that car loading requirements make it impossible to apply the cut uniformly, especially on small orders. Therefore, some small orders will be met completely, and the larger orders cut by more than 13 per cent.

Canadian mill managers reportedly were hopeful that they would be saved the responsibility of applying such delivery restrictions on the above-limit orders. Mr. Hoult, however, assured them that the hoped for arrangement by United States War Production Board to control orders and distribution of newsprint to American publishers was expected to go into effect July 15. This would apply to orders for August delivery.

◆

PROCUREMENT OF PULPWOOD RULED ESSENTIAL BY WMC

The procurement of pulpwood was officially declared to be essential on June 15 when the War Manpower Commission notified the American Paper and Pulp Association that its Committee on Essential Activities had interpreted the production of pulpwood to be encompassed within Group 7, Forestry, Logging and Lumbering, which is included in its List and Index of Essential Activities. Copies of the List and Index have been forwarded to all U. S. Employment Service offices and to all War Manpower Commission area, state and regional offices for use in connection with placement and stabilization policies and programs.

The WMC has not only declared pulpwood cutting operations as an essential activity, but has defined a general policy relating to essential activities. Specific application of this general policy is left in large part to local determination. It is believed, however, that since the burden of proof rests upon local officials, no action will be taken that will interfere with the essential rating. Certainly the declaration of essentiality places an obligation upon the State Employment Offices to urge men to engage in the procurement of pulpwood.

◆

▶▶▶ A FIRE OF UNKNOWN ORIGIN levelled the barking mill of the Anglo-Canadian Pulp and Paper Mills, Ltd., located at Laval, near Quebec City, but the arrival of Quebec firemen saved several pulpwood piles from destruction. The wooden building housing offices and machinery was completely destroyed, and damage is estimated at several thousand dollars.

CORN PROCESSING PLANTS CLOSE DOWN

An imminent threat to the operations of the paper and the boxboard industries is contained in the announcement of the Corn Industries Research Foundation that because of diminishing corn supplies, three of the largest corn refining plants manufacturing starches, syrups, dextrose, and other products of corn have been closed down.

First to shut down was the Pekin (Illinois) plant of the Corn Products Refining Company with a daily grinding capacity of 60,000 bushels of corn, and employing 1,200 workers. This plant closed June 21. It was followed four days later by the shutdown of the American Maize-Products Company plant, located at Roby, Indiana, just outside of Chicago; and then by the closing of the Clinton Company plant at Clinton, Iowa. Each of the two employs about one thousand workers, and each has a daily corn grinding capacity of 40,000 bushels.

These three plant shutdowns account for about one-third of the corn refining industry's total productive capacity, according to the Corn Industries Research Foundation, and they represent a serious threat to the availability of starches and dextrins, which products are essential in large and continuous quantities to the operations of paper and boxboard manufacturers who employ them in all divisions of their industries.

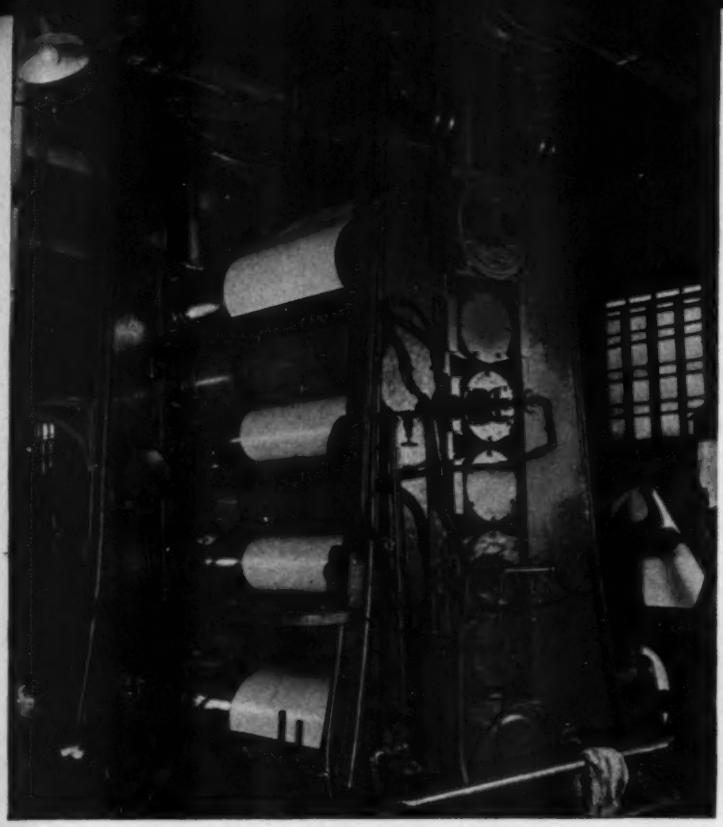
Paper manufacturers and boxboard makers, it is well known, are large and continuous users of starches and dextrins, employing these products in all divisions of these industries.

The cause of the situation is the almost complete stoppage of corn shipments to the terminal markets of the country, which means, of course, that the corn refiners are unable to buy the chief raw material used in their operations.

Nothing like this has happened in the 50 years of the industry's history, and it is the unexpected result of the corn-hog policies initiated by the Secretary of Agriculture some time ago, current weather conditions being only a minor incident in the situation.

In an effort to stimulate livestock production, high selling prices were guaranteed for hogs, and price ceilings were set on corn with the result that the farmers of the corn belt plunged on swine production, the marketing of corn in the form of pork proving highly profitable. Accordingly, the swine census is now almost double the figures of normal years—and there is little or no corn for other corn users.

In this connection, it should be noted that the corn refiners are using only a small fraction of the corn crop,



Calender stack bearings like these are subjected to heavy loads and the steady heat generated by friction.

3 suggestions

for simplifying the maintenance of your hard-used bearings

►MAKING EQUIPMENT bearings last for the duration—and with fewer oil changes and less attention—is the task facing many paper mill operators. Here are practical suggestions for simplifying your maintenance schedules on three hard-used bearing jobs.

1. To save man-hours on calender stack bearing care. Because these equipment bearings work against high pressures and the steady heat generated by friction, heavy oils generally give best results. No matter whether these bearings are lubricated individually or by a circulating system, the oil must be stable, have low sludge-forming tendencies, and have the ability to carry heavy loads. . . . Many operators say Stanoil is the best bet for this job. The heat doesn't bother it, and it keeps going over long periods without any sign of deposit formation in bearing wells.

In dryer journals widely varying temperatures in bearings on the same machine present a grease problem.

2. Dryer journal greasing made easier. The widely varying temperatures in bearings of the same dryers are apt to complicate the greasing problem. In order to avoid the bother and expense of using a number of grades of greases on one machine, Standard Lubrication Engineers stand ready to analyze methods of application, help control rate of feed, put an end to over-consumption and glazing. . . . One mill reported that the use of Stanolind Mill Grease dropped consumption 30% on the dryer journal shown at left below.

Anti-friction bearings, with longer hours of operation, call for a more stable grease to resist heat and oxidation.

3. How to service anti-friction bearings faster. Longer hours of mill operation called for a more stable grease to resist heat and oxidation, while the need for more frequent lubrication of anti-friction bearings makes an easily handled gun grease a big help in speeding up the job. . . . Stanobar brings you both these advantages. It's a smooth (not fibrous) type grease. It contains inhibitors which reduce oxidation of both the soaps and oil in Stanobar. That means fewer cleanings of bearings and less labor and lubricant needed to flush out old grease.

Has your plant some bearings that call for bothersome "babying"? You name the job, then call in a Standard Lubrication Engineer to give you the benefit of his broad and practical experience. Chances are, he's worked on problems just like yours. Get in touch with the nearest Standard Oil Company (Indiana) office, or write 910 South Michigan Ave., Chicago, Ill., for the Engineer nearest you.

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that is, some 130 million bushels of the three-billion bushel crop of 1943.

Executives of the corn refining industry saw one or two cheerful aspects in this otherwise gloomy situation. They expressed the belief that the government representatives now recognize the fact that the output of the corn refining plants is vitally needed in the war effort and that unless the necessary corn supplies are found, the execution of many important war contracts may be seriously hampered. Furthermore, since the corn supplies needed are only a small fraction of the total corn crop — last year's corn grind of 130,000,000 bushels was only 4 per cent of the total corn crop of 3,200,000,000 bushels — they are hopeful that adequate supplies may be found without great delay and without disruption of the current overall corn situation.

◆

FINANCIAL

▶▶▶ A BETTER TONE in the securities markets was reflected by paper mill securities during June. Transactions were heavy in all branches of industry, indicating a somewhat better sentiment toward the business future.

A. P. W. Paper Company — Net profit for ten months ending April 30, after provision of $50,000 for contingencies, was $26,407, compared with $199,549 for the comparable period a year ago after provision for inventory reserves and contingencies.

Celotex Corporation — Directors have voted to split the present preferred stock with a par value of $100 into five shares with a par value of $20. The new issue, like the old, will be a cumulative 5 per cent dividend issue.

Certain-teed Product Corporation — Net profit for the March quarter was $119,236 as against $292,635 for the same quarter of 1942.

Container Corporation of America — A dividend of $0.25 per share payable August 20, 1943, to stockholders of record August 5, 1943 was declared by the Board of Directors.

Gaylord Container Corporation — Net income for three months ending March 31 was $238,584 as against $273,133 a year ago.

Masonite Corporation — Net profit for the quarter ending May 31 was $244,320, and net profit for the nine months ending that date was $847,750.

Puget Sound Pulp and Timber Company — First quarter net earnings were $110,547 as compared with $237,522 in the first quarter of 1942.

United Paperboard Company — Net profit for nine months ending February 27 was $16,968, before federal income taxes, compared with $287,511 after provision for such taxes for the comparable period a year ago.

West Virginia Pulp & Paper Company — Net income for the six months ending April 30 was $1,555,308 as against $2,513,629 for the comparable period in the previous fiscal year.

New York Stock Exchange—Stocks

	Closing Prices June 25, 1943	May 25, 1943
A. P. W. Paper Co...	2¾	*2½–2⅞
Celotex	13⅞	13½
Same Preferred	91	*91¼–91½
Certain-teed	7	6⅞
Same Preferred	57⅜	58
Champion P. & F. Co.	21⅝	19¾
Same Preferred	104	*108–110
Container Corp.	22⅝	22½
Cont. Diamond	15⅜	13⅝
Crown Zellerbach	15¼	14⅜
Same Preferred	93½	92¾
Dixie Vortex	14½	*14⅛–14½
Same "A"	42¾	41
Robert Gair	3¾	3⅞
Same Preferred	14	13⅝
Gaylord Container	13⅞	14¼
Same Preferred	51¼	51⅞
International Paper	12¼	11⅞
Same Preferred	58⅜	56
Kimberly Clark	31¼	*30¼–31⅞
MacAndrews & Forbes	26¾	*25⅞–26¼
Masonite	39⅜	38¾
Mead Corp.	9	9⅜
Same Preferred	82	82
Paraffine Cos.	41¼	42½
Same Preferred	105	105
Rayonier	15⅜	12⅝
Same Preferred	29¾	*29¾–29½
Scott Paper	40¾	*42–42⅜
Same 4½% Pfd.	113	*111⅜–114
Same 4% Pfd	112	110½
Union Bag & Paper...	10⅞	10⅞
U. S. Gypsum	72	70
Same Preferred	184	*180–185

New York Stock Exchange—Bonds

Abitibi 5%	76⅞	70
Celotex 4½%	101¾	102
Certain-teed	99¾	95⅞
Champion P. & F. Co.		
International Paper		
5%	104¾	103¼
Same 6%	106¼	106½

New York Curb Exchange—Stocks

Am. Boxboard	7¾	
Great Northern	33	32
Hummel Ross	4⅛	
St. Regis	3⅞	3⅜
Taggart	4½	
United Wall Paper...	3	2⅞

*Closing Bid and Asked Prices.

◆

CHAMPION SPONSORS VICTORY GARDENS FOR 2ND CONSECUTIVE YEAR

Victory Gardens are being sponsored by The Champion Paper and Fibre Company, Hamilton, Ohio, for the second successive year. This year the company leased, plowed, and made ready for cultivation 24 acres of land on the outskirts of Hamilton. The land was divided into lots of about 40 by 100 feet, making about 258 gardens which were assigned, at no cost, to employees by drawing names out of a hat. Booklets and literature were distributed free of charge, and seeds were supplied at cost to each gardener. Publicity is carried in the company publications, "The Log," and "Chips," and periodic ratings are given the gardens to increase competitive spirit.

From last year's experience, it was found that a garden 40 by 100 feet would supply summer and fall vegetables for a family of 5 and provide for canning 200 quarts. Rains held up early planting, but by June 1, the first vegetables were gathered, and the month of June found many gardeners with abundant supplies of a large variety of vegetables.

◆

A LEGACY FOR SOMEONE

Neil Cooney, pioneer Grays Harbor lumberman, who belonged to the lusty, roaring days of the Pacific Northwest lumber industry, took measures before his death on May 8, to insure the future of the town of Cosmopolis, where he made his fortune and bore a leading part for 55 years. The measures he took were characteristic.

He provided that $100,000 in cash and a splendid industrial site of more than 500 acres with ample frontage on deep water should be given to the firm or individual or group that would build a pulp mill of not less than 150 tons daily capacity at Cosmopolis. The money is in the bank and the title to the site is ready.

When Neil Cooney wanted anything done, he wanted it done promptly, for he was impatient of delay and objections, and it was also characteristic that he provided the projected pulp mill should be under contract within seven months after his death. Just as he was quick in his own actions, he wanted quick action in this matter. When he conceived an enterprise, it was half way to completion so far as he was concerned. If he believed it could be accomplished, he brushed aside obstacles. If one way should be blocked, he tried another, for he always considered there was a way. So priorities and any other matter that might stand in the way of pulp mill construction at this time would not bother him.

Mr. Cooney came up the hard way. A Canadian by birth, and a ship's carpenter by trade, he came to Cosmopolis in 1888. In a year he was outside superintendent for the Grays Harbor Commercial Company; in a few more years he was assistant to the general manager; then he became general manager and finally sole owner of the operation. After the mill was suspended and razed in 1929, Cooney bought from the original owners the mill site, other property in Cosmopo-

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• DIVISION •

lis, and timber nearby. He held it all intact against the day, which he foresaw, when the timber industry would be something more than sawmills, and producing many articles other than lumber. He contended that Cosmopolis was the best possible location for a large timber manufacturing concern, and he had great faith in the pulp and paper field.

Mr. Cooney had no great amount of formal school education, but he had a sharp, penetrating mind. He had few peers in getting to the root of any proposition, either in business or public affairs. He could strip a statement to its core and put it in his own blunt language until the facts stood out stark and bare. He knew the lumber business thoroughly, and when it came to other businesses in which he might be interested for investment or other purposes, he made it his business to know them, too. He knew men also, and could appraise them as he would a balance sheet. He belonged to the era of rugged individualists, and he was among the most rugged. He placed self reliance high on his list of virtues, and that is reflected in the requirements he attached to his bequest for the benefit of Cosmopolis. There have been few more picturesque figures in the lumber industry than Mr. Cooney.

Aberdeen, sister city of Cosmopolis, has undertaken through the Aberdeen Chamber of Commerce a national campaign to publicize the unique "Cooney offer" and to assist Cosmopolis in securing the industry Mr. Cooney sought to provide for the town.

◆

IMPORT RULINGS

The United States Court of Customs and Patent Appeals has held that Japanese coffee filters in disc form are dutiable at 30 per cent as paper cut into shapes, according to a report issued by Warren B. Bullock, manager of the Import Committee of the American Paper Industry. The filters had been classified as tissue paper at 6 cents per pound and 20 per cent, and the basis of testimony in a New York case that the paper of which the discs were made was commercially known as tissue paper and not as filtering paper.

In the New York case, extensive testimony was given as to the nature of the paper in question, but the Customs Court held the paper to be filtering paper at 5 cents per pound and 15 per cent because of its actual use, a decision which was reversed by the higher court. Then, in Los Angeles, a similar case was tried, and the Court again held that the discs were dutiable as filtering paper. The Appellate Court, however, now holds that neither rate is correct, but that all filtering paper in disc form is dutiable at 30 per cent as paper cut into shapes. In the case just decided this rate is somewhat higher even than the 6 cents per pound and 20 per cent rate originally levied by the collector.

On the basis of the Appellate Court's decision, the higher priced chemical filtering paper will also be dutiable, if imported in disc form, at 30 per cent. This is much higher than 5 cents per pound and 15 per cent, the rate originally fixed for filtering paper by the Tariff Act. The British Reciprocal Trade Agreement reduced the duty to 2½ cents per pound and 7½ per cent for paper valued at over 75 cents per pound, a rate which, under the new decision, will only apply to filtering paper in sheets or rolls.

▶▶▶ Current imports of English paper consist of filtering paper, handmade drawing paper, duplex decalcomania, carbonizing tissue, and pottery tissue. Occasional shipments of other grades are received, but this list comprises practically all the paper now being received from Europe, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry.

The duty rate on vat-lined board, 30 points in thickness, is under consideration by Customs officials, the question being whether it is dutiable as vat-lined board or as test board. The board meets the technical requirements for either classification, and the Customs officials are trying to determine its commercial designation in domestic markets in order to decide whether to collect duty at $14.50 per ton as vat-lined board, or at 20 per cent as test container board.

The question whether kraft converting papers and kraft wrapping papers are to be valued alike for duty purposes has arisen at Detroit. The Customs officials have been furnished with information by the Import Committee showing that the paper industry in its statistical records segregates bag paper from wrapping paper, just as envelope kraft and other converting krafts are separately classified.

◆

PAPERBOARD IND. ADVISORY COMM. APPOINTED BY OPA

Fourteen executives have accepted appointment by the Office of Price Administration to serve on its newly-created Paperboard Industry Advisory Committee, which will consult with the Paper and Paper Products Branch on future pricing and other problems affecting the industry, according to an OPA announcement on June 30.

Membership of this committee has been recruited from representative paperboard concerns, located in all parts of the country, exclusive of manufacturers of fourdrinier kraft and specialty paperboards.

At its first meeting with officials of OPA in Washington on June 25, the committee elected G. G. Otto its permanent chairman, and W. J. Alford, Jr., vice-chairman.

Members of the committee are as follows:

J. J. Brossard, vice-president of Container Corporation of America, Washington, D. C.

F. S. Wakeman, vice-president of Ohio Boxboard Company, Ritman, Ohio.

George E. Dyke, president of Robert Gair Company, New York City.

G. G. Otto, vice president of Alton Box Board Company, Alton, Illinois.

Fred B. Zartman, president of Franklin Board and Paper Company, Franklin, Ohio.

W. Irving Osborne, Jr., president of Cornell Wood Products Company, Chicago, Illinois.

W. J. Alford, Jr., president of Continental Paper Company, Ridgefield Park, New Jersey.

P. A. Schilling, president of Waldorf Paper Products Company, St. Paul, Minnesota.

C. E. Carey, vice president of Central Fibre Products Company, Chicago, Illinois.

H. D. Schmidt, president of Schmidt and Ault Paper Company, York, Pennsylvania.

Newton Cuneo, general manager of Ontonagon Fibre Corporation, Ontonagon, Michigan.

S. J. Newcomer, vice president of Consolidated Paper Company, Monroe, Michigan.

Allan Goldsmith, vice president of Mead Corporation, Chillicothe, Ohio.

David Newman, president of Phil-Fibre Box Board Mills, Inc., Philadelphia, Pennsylvania.

◆

NEW ALCOHOL PLANT AT THOROLD INSPECTED

The new alcohol plant at Thorold, Ontario, has just been completed, and is turning out alcohol made from waste sulphite liquor. This project has been developed by the *Chicago Tribune* and its subsidiary, the Ontario Paper Company, Thorold.

It is estimated that the plant will produce annually 600,000 gallons of alcohol, which will be turned over for the production of synthetic rubber.

On June 18, Col. Robert R. McCormick, editor and publisher of the *Tribune* met with high ranking government officials of both the United

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States and Canada to inspect the plant. The inspection was followed by a luncheon with addresses which were broadcast by radio. Rubber Director William M. Jeffers was present, and forecast in his talk great possibilities for the production of so important and vital a product from wood pulp waste.

◆

FILLMORE AND SLADE MILL ACQUIRED BY BRIGHT AND STEVENS

John W. Bright and Robert B. Stevens, connected with the Stevens and Thompson Paper Company, Greenwich, New York, will head a new paper company to operate at North Bennington, Vermont, to be known as The North Bennington Paper Mills, Inc.

The corporation has completed plans for the purchase of a tissue paper mill located at North Bennington, from Fillmore and Slade, Inc. Officers of the new company are: president, Mr. Bright; vice president, Mr. Stevens; and clerk and treasurer, John F. McKeon. The company was incorporated in Vermont, with Mr. Bright and Mr. Stevens as the principal stockholders.

◆

BROWN COMPANY'S CASCADE MILL NOW MAKING ONLY PAPER

Several newspapers have carried an erroneous report stating that the Brown Company had closed its Cascade mill at Berlin, New Hampshire. Actually, only the pulp operations conducted at that mill were suspended on July 4, after which date all pulp is being produced at the company's Burgess pulp mill, which is the main pulp mill at Berlin.

Cascade mill has always been primarily a paper mill and is currently producing papers for war and essential civilian products. Its papermaking operations will be in no way affected by the consolidation of all pulp production at the Burgess mill.

◆

THIRD COMMENCEMENT OF CHAMPION CO.'S VOCATIONAL SCHOOL

The third annual commencement exercises of the Vocational Education School of The Champion Paper and Fibre Company, Hamilton, Ohio, were held at Camp Chapaco, near Hamilton, on June 24.

A 6:00 o'clock chicken dinner, at which A. S. Anderson acted as toastmaster, preceded the formal program. Homer Latimer, mill manager, made a short introductory talk, followed by an explanation of how vocational training not only benefited the employee, but also the supervisor and company, by Leo Geiser, paper mill superintendent; J. Piggott, coating mill superintendent; and C. L. McKasson, works engineer.

Walter Hildebrand, assistant director of Training Within Industry of the War Manpower Commission for the district, delivered the commencement address, and Mr. Latimer presented 137 diplomas and certificates to those completing their courses. Instruction courses were given in paper testing and inspection, wet end control, inspection practices, both elementary and advanced electricity, elementary chemistry, both elementary and advanced blueprint reading, plant safety, general paper study, pipefitting, production mathematics, and office training.

◆

TAYLOR-LOGAN CO.'S MACH'Y AND EQUIPMENT ARE SOLD AT AUCTION

Machinery, equipment, and office furniture, formerly the property of the Taylor-Logan Company, Holyoke, Massachusetts, was sold at auction June 4. About 35 bidders took part in the sale.

The largest machine in the building, a fourdrinier paper machine, was sold to J. J. Ross of the Ross Machine Company, Newark, New Jersey, for $1,725. The Ross Machine Company deals in old and new paper machines, and the fourdrinier, idle for the past two years, may be resold after being rebuilt.

◆

WISCONSIN COMMITTEE ON WASTE DISPOSAL MEETS AT INSTITUTE

The Sulphite Pulp Manufacturers Committee on Waste Disposal met at the Institute of Paper Chemistry, Appleton, Wisconsin, on June 9 to review recent progress made toward the elimination of the stream pollution problem. The main item of interest was the inspection of a semicommercial scale of experimental plant for the disposal of waste sulphite liquor.

This pilot plant has been constructed at the Interlake Mill of the Consolidated Water Power and Paper Company on the Fox River just below the Institute. It is based on the trickling filter principle. The clogging, which formerly interfered with the success of this principle, is believed to have been overcome.

The committee on waste disposal was organized several years ago with the co-operation of the state board of health and the state conservation department to develop some method of disposing of the great quantities of sulphite liquor being dumped into streams by paper mills. It is a voluntary effort on the part of the industry to attempt to help eradicate stream pollution.

◆

W. H. FOX & SONS MILL CLOSED AFTER OPERATING 78 YRS.

The paper mill of W. H. Fox & Sons, Penn Yan, New York, has been shut down after having operated for the past 78 years.

Several factors entered into the closing down of the plant, which employed about 30 men. About a month ago, the mill dam gave way under the weight of increased water caused by excessive lake level. This fact, together with transportation problems and the decrease in supply of straw caused by the late, rainy season, caused suspension of operations.

The mill was founded by the late W. H. Fox, pioneer in the manufacture of paper from straw. The mill was originally used for manufacture of flour, feed, plaster, and also as a saw mill, prior to its conversion into paper manufacturing by Mr. Fox, father of the present president of the company, John C. Fox. It has also been known as Keuka Mills.

◆

TORONTO STARTS PAPER SALVAGE DRIVE IN SUMMER

July 7 marked the beginning of a new paper salvage drive in the Toronto (Canada) area. The objective of the drive, which will continue for four months, is to build up stocks as a winter reserve.

Last year a similar drive was conducted in this area, and the response was so satisfactory that stocks of paper sufficient for six months were laid up, carrying the paper industry safely through the winter and enabling it to fulfill its wartime commitments.

◆

SHIPBUILDING DIV. OF ANGLO-CANADIAN UNDER NEW COMPANY

A new company, Quebec Shipyards, Ltd., a Crown company, has been established to co-ordinate the shipbuilding activities of Morton Engineering and Dry Dock Company, Ltd., Quebec; George T. Davie and Sons, Ltd., Lauzon, Quebec; and the shipbuilding division of Anglo-Canadian Pulp and Paper Mills, Ltd.

Announcement of the new company was made on June 18 by Munitions and Supply Minister C. D. Howe. Elliott Little, general manager of

NEW CYANAMID MELAMINE RESIN PROVIDES IMPROVED, LASTING "WET STRENGTH" IN PAPER

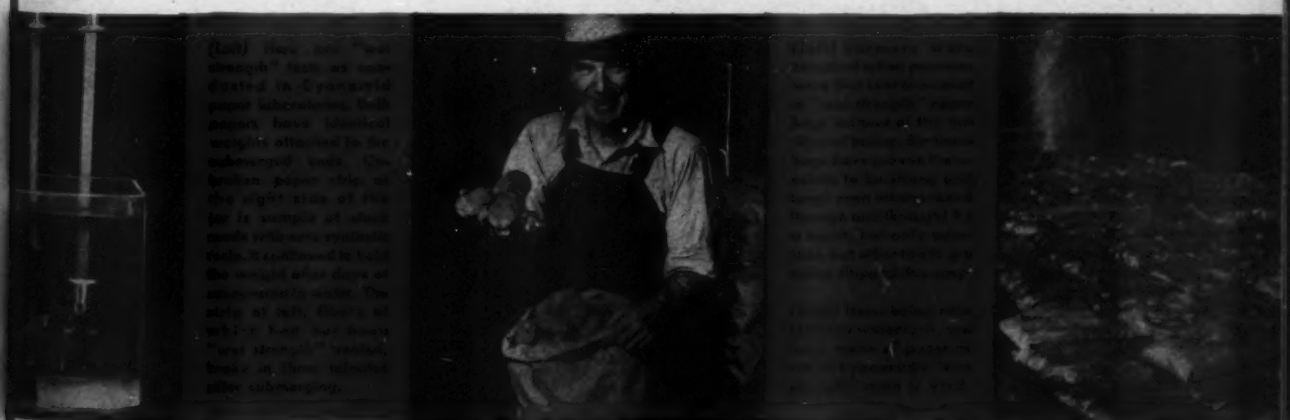
Cynamid's "secret" of providing "wet strength" to paper lies in the use of a special type of resin of exceptional efficiency which bonds fibers together so that they are highly resistant to separation when exposed to moisture. This new resin, developed in the Cyanamid laboratories, can be added directly to the fibers prior to the formation of the web. Thus without special equipment, manufacturers may turn out papers and packages that can replace and even improve upon the service qualities of critical materials.

This new resin, therefore, may be said to point the way to new usefulness for paper. Not satisfied, however, with the production of a material that would accomplish all this, research men in Cyanamid's paper chemical laboratories have by their diligent efforts been able to improve both the product and method of application.

Packaging papers, particularly where these are likely to be exposed to water such as in overseas shipments, have brought about an insistent demand for this new resin. Other fields of wartime use are for map, chart and blueprint papers . . . booklet stocks for field use . . . bandage and medical supplies . . . and other uses where resistance to inclement weather conditions is an important consideration. Here on the home front "wet strength" paper bags are replacing the traditional burlap for shipment to market of vegetables such as potatoes where vegetable moisture or wet weather might cause bursting of bags. It is likewise being used for tougher wrappings for meats and frozen foods . . . paper toweling and lens-wiping tissues.

Where strength (when wet) is the controlling factor governing basis weight of paper, the use of this resin will permit substantial reduction in basis weight with worthwhile savings in pulp.

For full details on the utilization of Cyanamid's new "wet strength" resin, see your Cyanamid representative or write to nearest Cyanamid office.



American Cyanamid & Chemical Corporation

(A Unit of American Cyanamid Company)

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DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California; Seattle, Wash.

Wax Sizes • Rosin Size • Synthetic Resins • Casein • Alum • Benowax* Corn Starch • Sulphonated Oils • Fillers Defoamers • Soda Ash • Caustic Soda • Salt Cake Acids • Clays Satin White • Aerosol* Wetting Agents Calmicro (Calcium Carbonate) and other Paper Chemicals

*Reg. U.S. Pat. Off.

Anglo-Canadian Pulp and Paper Mills and former director of National Selective Service, is one of the directors of the new company, and a representative of organized labor will also be appointed to the directorate.

◆

BROMPTON SELLS CLAREMONT CO. TO WILLIAM A. KIRN

Claremont Paper Company, Inc., Claremont, New Hampshire, was purchased on June 26 by William A. Kirn, of Claremont, from Brompton Pulp and Paper Company, Ltd., East Angus, Quebec, owners since 1918.

New officers are president and treasurer, William A. Kirn; vice president, George P. Tenney; and secretary, Sarah E. Warren. Directors include Mr. Kirn, Mr. Tenney and the firm's corporation lawyer, Dudley W. Orr. It has been announced that there will be no changes in personnel or policy.

◆

PLANS CONSIDERED FOR PULP MILL IN EIRE

According to *Foreign Commerce Weekly*, plans for erecting the first wood pulp mill in Eire are under consideration. Sitka spruce, from the Slieve Book Mountains in County Tipperary, will be used as raw material.

For the past 30 years, the Eire Forestry Commission has been concentrating on production of the spruce in this area, and it is estimated that when fully developed, these forests will produce upward of 40,000 tons of suitable wood each year.

◆

ADVISORY COMMITTEES FOR ALL INDUSTRIES

Advisory committees to cover all industries affected by OPA price regulations are to be set up immediately "as a matter of administrative policy rather than waiting for demands of industry exercising their right under the Emergency Price Control Act," according to Administrator Prentiss M. Brown. While the Price Control Act requires OPA to set up advisory committees on the request of representatives of an industry, under the new policy inaugurated by Mr. Brown, advisory committees will be set up for all industries whether or not a request has been made. At present 92 industry advisory committees have been formed.

Louis H. Harris, chairman of OPA's Industry Council, has full responsibility for the formation and operation of the committees. In general, the new regulation and operating order asks price executives not only to establish and supervise industry committees, but also to call meetings at appropriate intervals and otherwise conduct negotiations with industry, and then file reports and recommendations with the Secretary of OPA.

Those industry advisory committees already appointed will continue to function, but they will now follow the procedure supplied by the new regulation.

◆

PLAN TO CUT DOWN ABSENTEEISM ADOPTED BY SCOTT PAPER CO.

A new plan for cutting down absenteeism by awarding bonuses for attendance has been proposed by the Scott Paper Company, of Chester, Pennsylvania.

Under the plan, which affects approximately 550 employees, all employees hired since July 1, 1942, who have perfect attendance records between May 16 and July 3, will receive a bonus equal to three days' wages. Each day of absence during the period eliminates one day's pay. Employees with more than one year's service are eligible for a two-weeks' vacation. The plan has been approved by the Regional War Labor Board.

Briefs . . .

▶▶▶ ARTICLES OF ORGANIZATION have been filed for the Wing Company, Appleton, Wisconsin, recently formed to manufacture or sell paper and paper products and supplies used in their manufacture. The articles were signed by Dorothy H. Wing, William C. Wing, Jr., and Orpah M. Owen. Capital stock is listed at $10,000.

◆

▶▶▶ FITTING TRIBUTE was paid by Kieckhefer Container Company, Delair, New Jersey, to its 210 former employees now in the armed forces at a ceremony on June 20. A plaque, honoring two killed in action, was unveiled at that time.

◆

▶▶▶ A 100-INCH PAPERMAKING machine formerly used in the American Writing Paper Company's mill at Windsor Locks, abandoned and razed several years ago, is now in operation at the National Pairpoint Corporation, New Bedford, Massachusetts.

◆

▶▶▶ SOUND EMPLOYER-EMPLOYEE RELATIONS based on mutual respect and good will, with collective bargaining preferably on a voluntary basis, was urged by the Canadian pulp and paper industry, largest single-industry employer in Canada, in a brief presented on June 10 to the National War Labor Board by Elliott M. Little, general manager of Anglo-Canadian Pulp and Paper Mills, Quebec, and former director of National Selective Service in the Federal Department of Labor.

◆

▶▶▶ FULL TIME OPERATIONS have been resumed at the Warrensburg Pulp and Paper Company, Warrensburg, New York, which company some months ago purchased the plant of the Schroon River Pulp and Paper Company at auction and renovated the place. Many of the former employees of the mill have returned to their old positions.

◆

▶▶▶ POSTWAR PROBLEMS of the forestry industry of Canada will be the chief point of study of a newly formed committee of forestry experts, specialists, and technicians, according to an announcement by Honorable Wilfrid Hamel, Quebec Minister of Lands and Forests. Mr. Hamel will serve as chairman of the committee, which will include representatives of the pulp and paper industry and several government officials.

◆

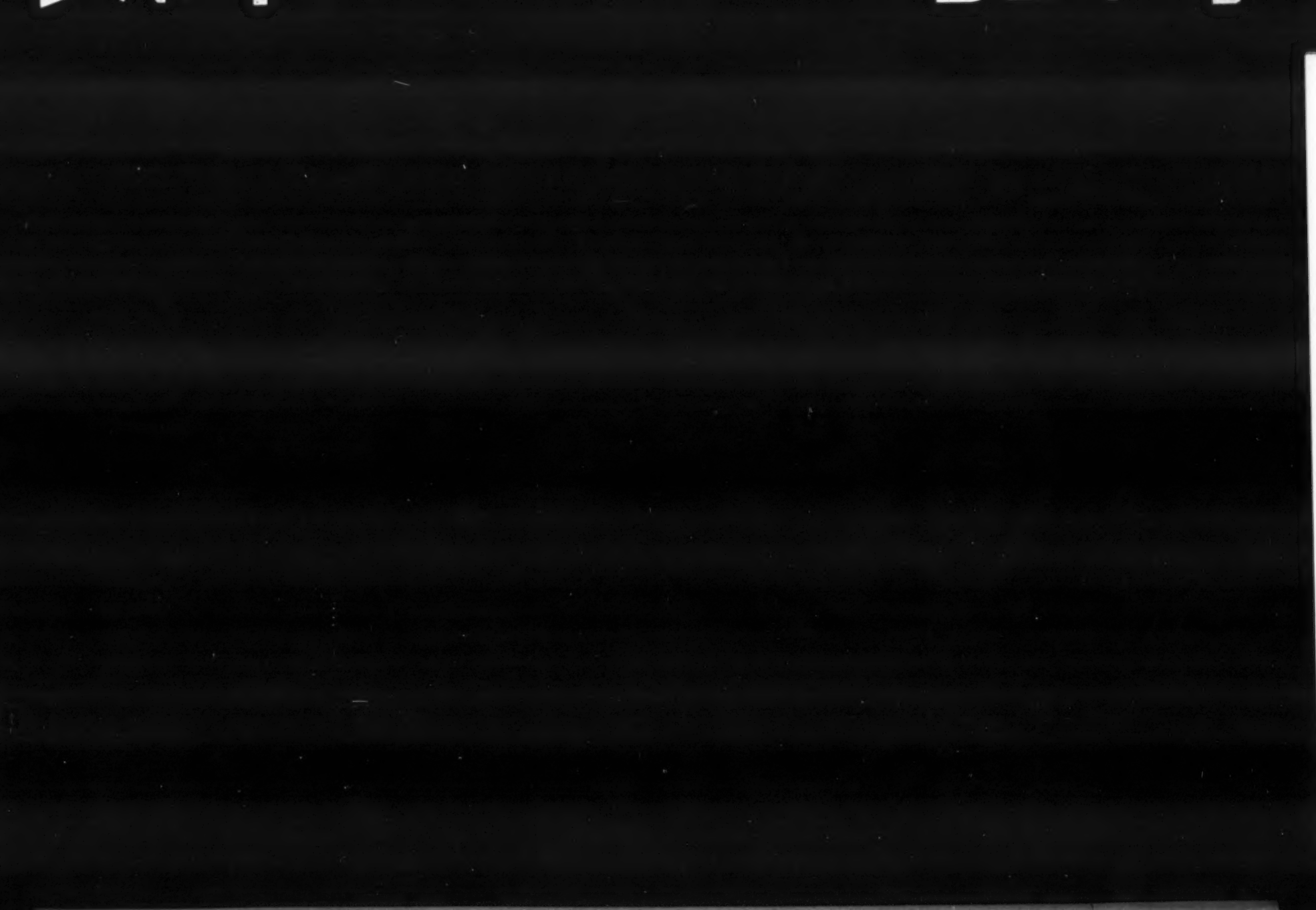
▶▶▶ THE QUEBEC FORESTRY ASSOCIATION has established two awards to be made annually to farmers and small land owners for improvement of woodlands on their property. For the senior section, comprised of colonists, farmers, or other proprietors owning 10 to 300 acres of forest land, a prize of $100 is offered, while candidates for the junior section are 4-H Clubs who have reforested 1 to 10 acres of land. Woods of maple trees are excepted in both cases.

◆

▶▶▶ THE WRAPPING PAPER SITUATION has become acute, and in Chicago a campaign has been under way to collect brown wrapping paper, bags, and similar papers having a large sulphate content to add to the pulp supply.

◆

▶▶▶ IN CUBA paper bags have been used successfully instead of jute for transporting raw sugar. A United States paper manufacturer is reported to have carried on this experiment.



You Can't Afford Leaky Valves..

- Repair parts are scarce
- New Valves require high priorities
- Your present Valves have to serve better-longer
- Regrinding helps make them last longer
- Note the Illustrations showing the six simple operations required

They're expensive and they may result in costly slow-downs and sometimes even shut-downs—which can't be tolerated in these critical times.

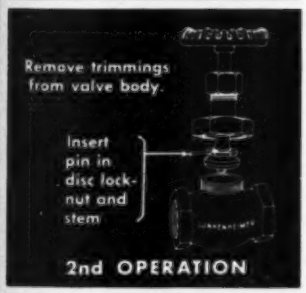
With proper care . . . periodic inspection to locate even slight leaks . . . and immediate repair, your valves will serve you better and last longer.

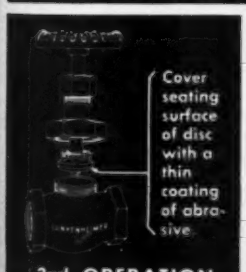
Lunkenheimer Valves are easy to keep in good operating condition. Seats and discs can be readily reground and all parts are quickly accessible without taking the valves out of the line. Properly cared for, they give you a practically permanent installation.

The complete facilities of Lunkenheimer distributors are at your service. They'll go all out to help you get the things you need.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
—"QUALITY"—
CINCINNATI, OHIO, U. S. A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK

Ask for Catalog 78 and the Guide for selecting valves.





Replace trimmings in body and regrind.
Extension on bottom of hub should enter neck of body while regrinding.
Allow union ring to remain loose.
4th OPERATION

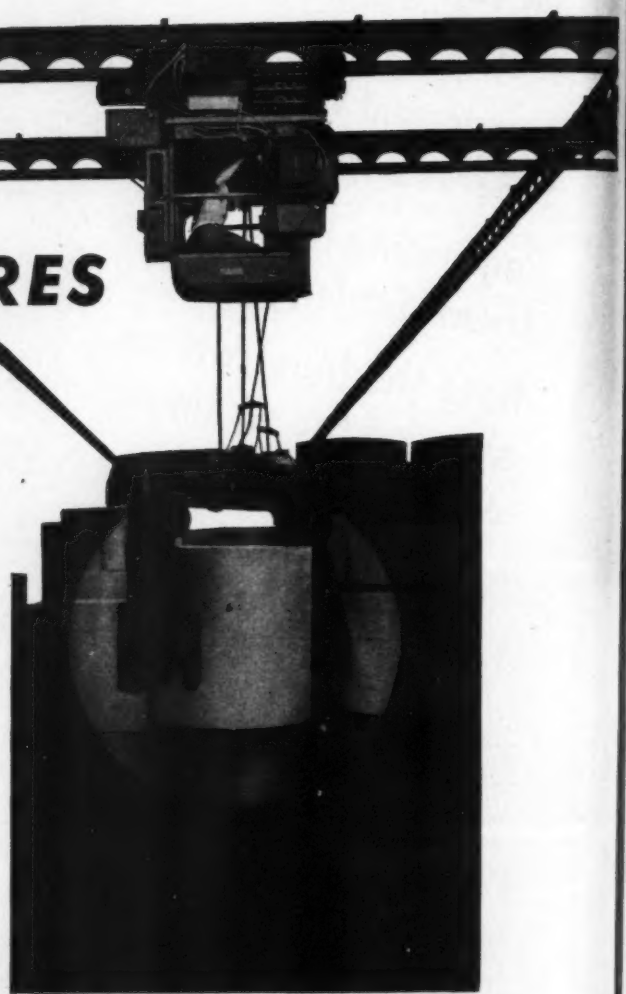
When finished regrinding remove trimmings from body.
Remove pin.
Thoroughly cleanse seat and disc seating surfaces of abrasive.
5th OPERATION

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS

MOTORIZED ROLL GRAB

has

NOVEL FEATURES

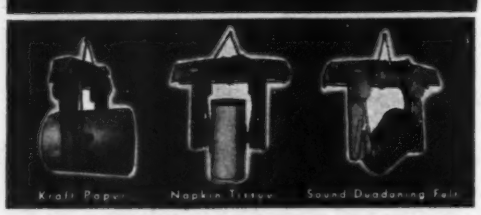


The new Cleveland Tramrail roll grab handles rolls from 16-inch minimum to 60-inch maximum diameter in lengths up to 72 inches and weighing up to 5,000 pounds.

All motions are motorized, and are controlled from the crane operator's cab. Three motors are provided. One motor spreads and retracts the grab arms. Another squeezes the roll grippers after they have been brought close to the roll, and thus securely locks the roll in position and prevents any possibility of slipping away and falling in transit. The third motor operates the turn-over mechanism which makes it possible to pick up a roll in any position and place it in any other position. Thus a roll piled vertically can be picked up and placed in a horizontal position.

When a roll in the vertical position is to be picked up and delivered in a horizontal position, or vice versa, the turn-over mechanism can be operated while the crane is in motion, thus saving time that ordinarily would be consumed for this operation.

The grab is suitable for the handling of all grades and thicknesses of paper, from light crepe and tissue paper, sound-deadening felt to kraft and hard box-board. It is sold for use on Cleveland Tramrail only.



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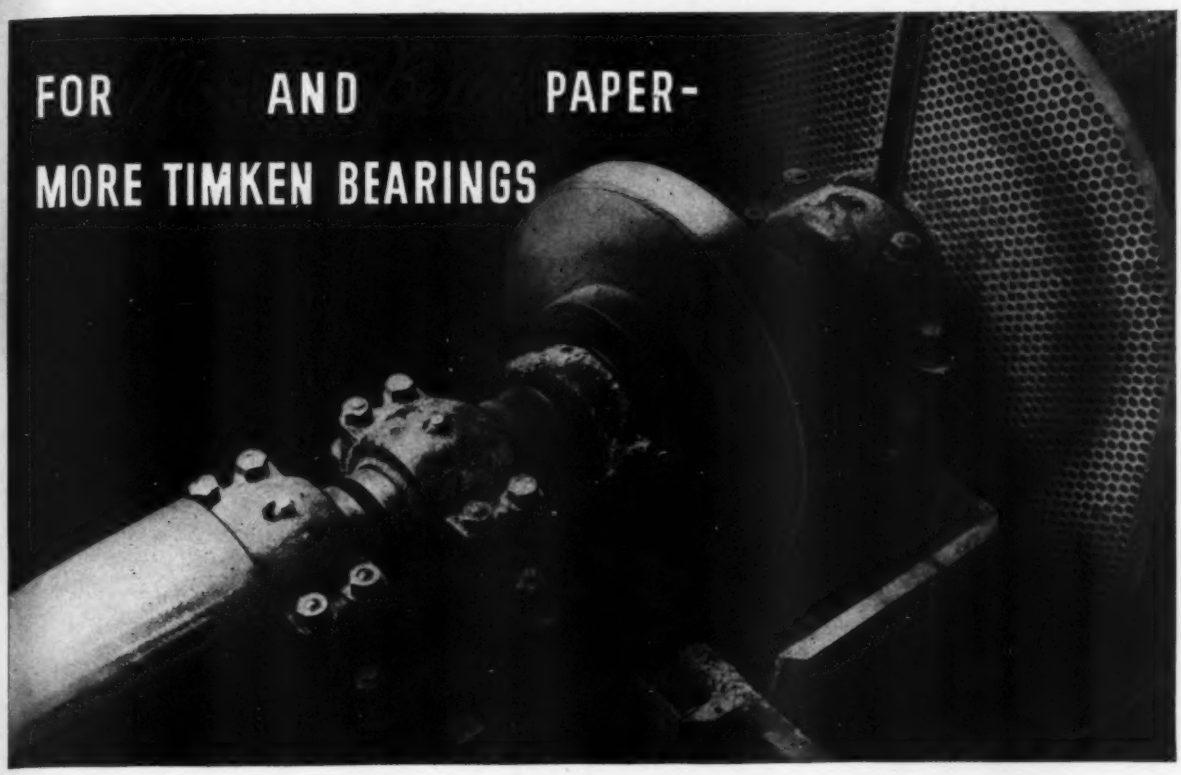
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1165 East 283rd St. Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT



The beginning of Timken Bearing efficiency in modern paper-making. Dodge-Timken Clamp Sleeve Pillow Blocks on paper machine drive.

MORE PAPER because machines can operate faster; require less attention for lubrication and upkeep; stand up longer; show less waste due to web breakage and lubricant contamination.

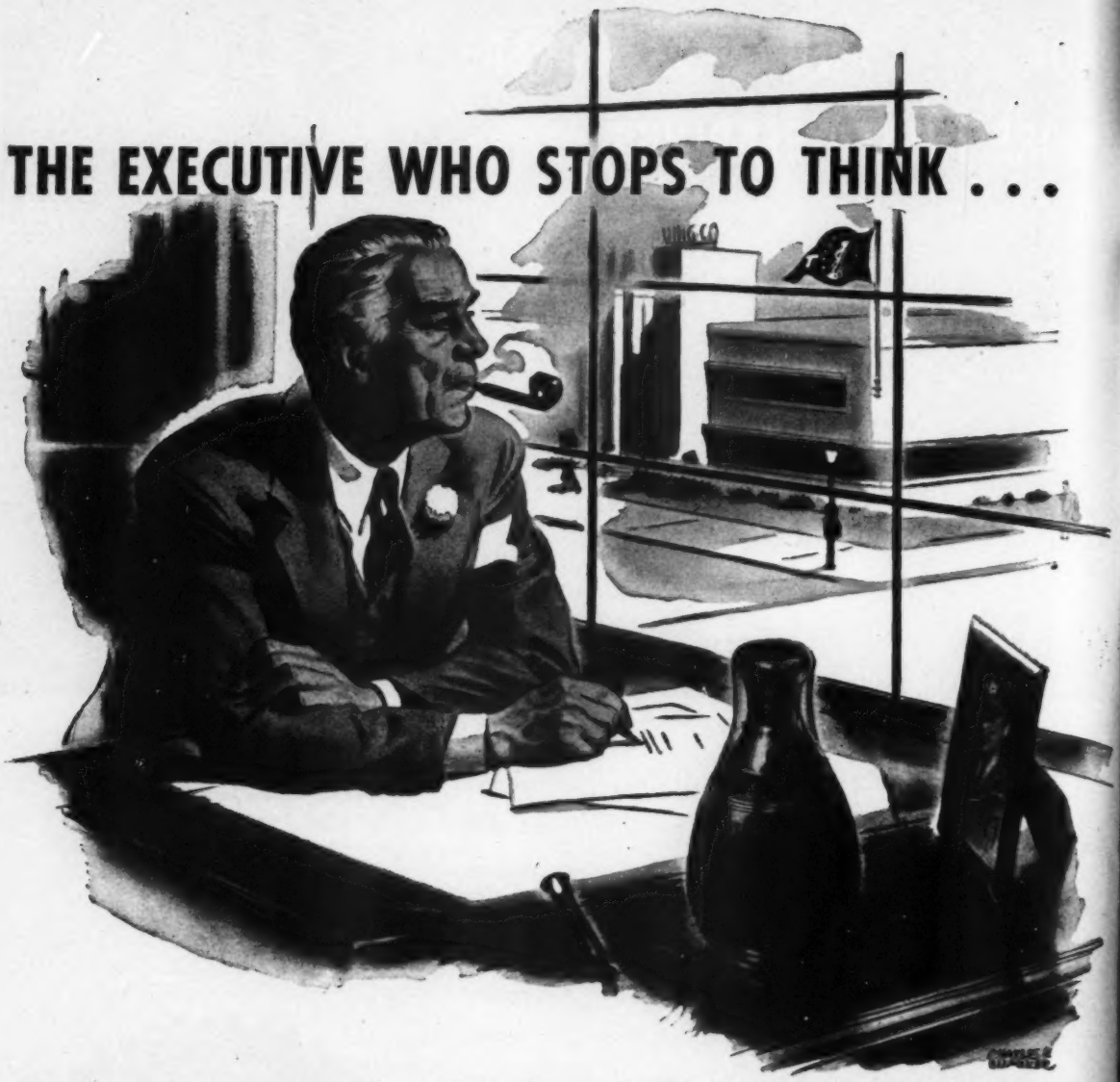
BETTER PAPER because machines operate more accurately and uniformly. Rolls and other rotating parts are kept in correct and constant alignment under all operating conditions.

While production and quality may be regarded as paramount, economy also enters the picture in a big way through saving of power and lubricant; reduction of maintenance and extension of felt life.

No matter what kind of paper mill equipment you manufacture or buy, the more Timken Tapered Roller Bearings it contains the better it will operate, the longer it will last and the less it will cost for operation and maintenance. The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

THE EXECUTIVE WHO STOPS TO THINK . . .



Knows that "10% for War Bonds isn't enough these days"

Workers' Living Costs going up . . . and Income and Victory Tax now deducted at source for thousands of workers . . .

Check! You're perfectly right . . . but all these burdens are more than balanced by *much higher* FAMILY INCOMES *for most of your workers!*

Millions of new workers have entered the picture. Millions of women who never worked before. Millions of others who never began to earn what they are getting today!

A 10% Pay-Roll Allotment for War Bonds from the wages of the family bread-winner is one thing—*a 10% Pay-Roll Allotment from each of several workers in the same family is quite another matter!* Why, in many such cases, it could well be jacked up to 30%—50% or even more of the family's *new* money!

That's why the Treasury Department now urges you to revise your War Bond *thinking*—and your War Bond *selling*—on the basis of *family* incomes. The current War Bond campaign is built around the family unit—and labor-management sales programs should be revised accordingly.

For details get in touch with your local War Savings Staff which will supply you with all necessary material for the proper presentation of the new plan.

Last year's bonds got us started—*this year's bonds are to win!* So let's all raise our sights, and get going. If we all pull together, we'll put it over with a bang!

This space is a contribution to America's all-out war effort by

THE PAPER INDUSTRY AND PAPER WORLD

you've done your bit
. . . now do your best!

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

They Saved Money by Throwing Felts Away

There comes a point in every dryer felt's life when it begins to waste more money than its replacement involves. When its fibres lose their resilience and capillary attraction for moisture, the felt becomes waterlogged and inefficient.

A good example is the recent report from one mill which states that they found it possible to make a material saving in steam cost alone by discarding old dead felts with glazed-over and clogged weave, and installing new HOOPERWOOD Cotton Dryer Felts—enough saving in steam alone to pay for a new felt every week—not to mention the material increase in drying capacity and consequent greater production.

This is only one of many cases where progressive mills, today, are saving money, not by "stretching the life" of old felts, but rather by replacing them as soon as their drying efficiency begins to fall off. It is just plain good business.

Are your dryer felts costing too much per ton of production? We will be glad to discuss the problem with you and help you select the HOOPERWOOD Felt best suited to your requirements.

WM. E. HOOPER & SONS COMPANY

PHILADELPHIA PENNSYLVANIA

Since 1800

HOOPERWOOD DRYER FELTS

DARE WE DO LESS?

Lives of great men oft remind us
We can make our lives sublime,
And departing, leave behind us
Footprints on the sands of Time.

That is what men did at Valley Forge, on The Marne, at Bataan, and are doing today in the Solomons, in Africa, in Russia and China. Dying that others may live . . . leaving imperishable footprints on the sands of Time.

Dare we at home do less—today—when so much is at stake? Tens of millions cry "No" and production becomes a flood.

Of those tens of millions, hundreds stationed at Black-Clawson, Shartle, Dilts . . . are working to the limits of their strength, producing a variety of products vital to the war effort . . . driving for Victory.

Yes, in this war even the man behind the man behind the gun can help to secure for posterity the Four Freedoms, plant his footprints firmly in the sands of Time.

BLACK-CLAWSON
SHARTLE-DILTS

THE BLACK-CLAWSON CO., HAMILTON, OHIO

DIVISIONS: Shartle Bros., Middletown, Ohio; Dilts Machine Works, Fulton, N. Y.

SHARTLE Dilts

. . . . . Editorial . . . . .

We Wonder?

▶▶▶ THE LATEST RULING affecting the paper industry proves one thing. It is conclusive evidence that finally the "powers that be" have been obliged to recognize that paper *is* an essential war commodity. For more than a year, a continuous fight has been carried on by members of the paper industry to convince the War Production Board that paper is a commodity essential to the war effort.

Paper was not on the critical list as were other war commodities, and the War Production Board steadfastly refused to declare paper an essential commodity, although that fact had been quite generally accepted.

Now the WPB states that because the demands for wood pulp by manufacturers of paper and paperboard are outstripping the supply and, therefore, the country is threatened with a shortage of pulp for military and civilian essential uses. This is the reason given for the new order that "All wood pulp is placed under WPB control."

Under this official announcement (which came from Washington June 29), the Pulp and Paper Division of the WPB will not only allot pulp to each producer, but will tell him how much he may use and what he may produce.

Each manufacturer is required to apply to the WPB by the fifth day of each month for authorization to use given quantities of wood pulp for specific end-uses during the following month. Allotments of pulp will be made presumably upon the basis of the essentiality of the end-use so shown.

In other words, the War Production Board hereafter will tell the paper manufacturers how much they can produce and designate the end-uses thereof. The OPA tells them what they may charge. All of which adds up to a complete Government operation-control of the industry—with the Government assuming no responsibility for the results of its control.

Now, the administration of this new Government order for the "control of all wood pulp," under force of an executive decree, may be fraught with some very dire consequences to many mills of the industry and, therefore, its probable application should be examined carefully and appraised.

For we do know — and it is a matter of painful record — that in the varied setups many of the orders issued have been wrong and unworkable, causing confusion, delays, loss of production and money to the industrial organizations attempting to comply; that the financial losses accruing through these mistakes have fallen upon the industries, thus creating hardships, inequities, and burdens from which they justly should be freed.

For instance: Let us assume that a paper mill, under the administration of this new Pulp Control Order, is so curtailed in its operation that it can (1) only produce at very substantial loss, or (2) is forced to liquidate because insufficient or no pulp is allocated to it. If this paper mill suffers the loss of its property, has it any redress?

Where do the equities lie, and how are they to be adjudicated under such procedure? We wonder?

Had the Government commandeered the paper mills and later shut down some of them, it would then become liable for any losses incurred or for damage sustained by such procedure.

The shortage of pulp was occasioned by the shortage of pulpwood. The shortage of pulpwood was occasioned by joint blunders of the War Manpower Commission and the Selective Service System — an unwarranted number of men critically needed for pulpwood and lumber, were taken from the forests in 1942.

During the entire year of 1942 the paper industry and the lumber industry worked, futilly, to have paper and lumber declared essential. Today, with 1943 half gone, both pulp and lumber have been declared essential — but too late to prevent both from facing irreparable shortages for the duration.

Then must the willing, patriotic, patient paper manufacturers face possible liquidation of their properties (or some of them) without recourse? Is this prospect justified because "this is war" when the country's industrial strength is geared for Victory?

Is the Government, therefore, to be freed from any liability for losses incurred? We wonder?

Victory cannot be won without paper, and it was inevitable that paper be declared as essential to the war effort. Then it is a patriotic duty to study and thoroughly appraise this latest Pulp Control Order.

We must keep mistakes on the home front to the irreducible minimum. It is patriotic to admit them; it is deadly to hide them or alibi them.

Saboteurs

▶▶▶ HOW MANY SABOTEURS are at work in your mill? "None," you say. Perhaps in the commonly accepted meaning of the word "saboteur," your answer is correct; but saboteurs are at work just the same. Their names are: Employee Accidents, Equipment Breakdowns, Materials Waste, and Lost Time.

Each one of these saboteurs is responsible for loss of production, for higher operating costs, for lower employee morale. They are insidious, cunning, and crafty. They never sleep. They are lurking constantly in every nook and corner, in fact, everywhere, for an opportunity to put in their dirty work.

To meet them at their own game has taxed the ingenuity of mill executives for many years. Safety contests have been inaugurated; welfare programs have been instituted; in fact, nearly everything possible, it seems, has been done to develop a proper *esprit de corps* of mill personnel.

The results of these efforts during the years past have been most favorable. Accident rates have been reduced materially and the cost of production has gone down. Of course, other factors also have contributed to some of the advances.

Now the pulp and paper industry is faced with a manpower shortage. Young men, old men, physically incapacitated men — and women — are being employed to fill the gap caused by employees who have left for the Armed Forces or possibly for more lucrative employment in war industries. Women are being employed by a number of mills for work done previously only by men.

The need for workers in the industry has been so acute that no doubt some workers have been employed who neither work as safely nor as efficiently as they would have been required to do previous to the present critical period. All in all, the present situation stacks up as a marvelous opportunity for new attacks on the part of those industrial saboteurs, which always have been present, but which have been rather effectively held in check.

Now, as never before, effective human relations is needed in industry. Also, there is need for a training program that is fast and sure. Through such activities, the industry can continue to go ahead and to satisfactorily do its part in the war effort.

Current Thought . . . . WILLIAM SIBLEY

Keep Your Eye On the Ball!

▶▶▶ WHEN THE BEVERIDGE PLAN became a matter of wide public discussion, not only in England but throughout the British Empire, Prime Minister Churchill speedily took to the radio and advised his fellow countrymen to "keep their eye on the ball," and to "get on with the job of winning the War."

Over here in the United States, for the past year, we have been treated to a long succession of debates, editorials, articles, treatises, papers, arguments, speeches, lectures, and what-have-you on the subject of "postwar planning." Good night! *Let's get on with the job of winning the War!!* When our house is blazing from every window it is no time to stop and talk with the insurance agent about a policy which would insure the education of our children ten years hence. When it is raining with the weight of a deluge—is no time to sit on the curb and talk about the purchase of a lawn sprinkler system for next year. The more we talk, *at this time,* about things and plans having to do with "cradle to the grave," the more American graves will be left in far distant and totally foreign lands.

More than a year ago William L. Shirer (or Ed Murrow, I've forgotten which) made a very harsh, but the very true statement: "America misses the incomparable advantage of being bombed" . . . By that statement he did not wish for us the great misfortune of being bombed out of our homes and factories. He meant to press home the realization that apathy and lethargy are the first things bombed out of existence—and that with apathy and lethargy present, American soldiers will die in needless numbers. Just stop a moment and present this picture to yourself:

In your mental picture, stay right where you are and live in your own town. But for purposes of discussion and description, we'll take the city of Chicago, a place that is at least superficially known to most of you. Okay—you live in one of the better residential districts, and have a good job which requires some 48 hours' work each week and which pays well. Suddenly—the sky becomes filled with airplanes which start to drop tons and tons of death in the form of TNT and magnesium. By far the greater percentage of these bombs drop on the stock yards—literally demolishing the entire area, either by force of explosion or fire. You, and ten thousand other men, are commandeered to help put out the fire and repair the damage.

. . . Just about the time you are well progressed with this mean and costly job, more bombers circle over Chicago and smash hell out of the Union station, the Northwestern station, the La Salle Street station, and the Illinois Central terminal. Nice business! So you work harder than ever repairing the devastating damage to our rail terminals in order that needed trains (many of them carrying military freight) may get through the city and on their way.

. . . But only two days later (even before you have quelled all the smoking embers of the ruined rail stations), still more bombers blast the Chicago Belt Line "Clearing Yard" and so create a terrific bottleneck of rail transportation. And again you add another ten hours a week to your already exhaustive time limit.

. . . Before you have even started to repair the damage to Clearing, a fourth and even larger fleet of bombers strikes at Chicago's Loop—two of the heavy explosives missing the Loop far enough to settle themselves, by trajectory, into the ninth floor of the tall St. Luke's Hospital on the lake front. Not a single one of the several hundreds of thousands of windows in the Loop buildings, or even those hardby the Loop, are still intact. Everything is smashed and heavy fires rage.

Just about that time, and still in the full knowledge that many, many more bombing raids were coming—thicker, heavier, and faster—you would be eager to sit down and calmly discuss and argue the points of postwar planning!! With piles of rubble, smoking ruins, and death—crying need for speed and more speed—with nation-saving demand on every side for immediate adjustment and readjustment—you would prattle about "cradle to grave," the "four freedoms," the "future Pan-American Union," the "United States of Europe," and "postwar planning"! Yes—you can just see yourself doing that, can't you?

Well—what do you suppose you are doing *now? Exactly that!* You have been bombed. As long ago as December 7, 1941, the *Arizona,* the *Oklahoma,* the *California,* the *Nevada,* the *West Virginia* (all capital ships)—plus three destroyers, a mine layer, a target ship, and a large floating dock were either sunk or so severely damaged that they will serve no military purpose for some months to come, even from *this* date. On Attu, Guadalcanal, the high seas' convoys, in Tunisia, American boys have been and are still being killed by the thousands, when taken in total. And you sit, thinking yourself smart, because you are reading a serious article about "postwar planning"! When some nonchalant communique comes over the radio that "14 bombers failed to return," that means a property disaster equivalent to Axis flyers dropping bombs and totally destroying the Book-Cadillac Hotel in Detroit, and upwards, if not more than, one hundred fine American boys. When that sort of thing is going on—it is just totally out of place to prattle about the kind of world we are going to live in, sometime—God knows when.

Military men tell us that Tunisia was but a curtain raiser, that the casualties and sufferings are yet to come. Lt. Gen. Somervell advises that our armed forces will not be fully equipped until the end of 1944. War Manpower Commissioner McNutt states that 5,000,000 new men must be inducted into industry before the end of this year. Secretary of War Stimson has issued a warning against overoptimism. He reminds us that "the Axis countries have hundreds of divisions of seasoned troops in the field." If these men don't know what they are talking about, I don't know who does—and certainly none of their statements indicate that we can rest on our oars, or allow ourselves to be diverted from the subject matter in hand.

The genius of America can place superior weapons in the hands of our fighting forces—can save lives and shorten the War in direct proportion to the effort expended by every man and woman identified with industry, regardless of the position which he or she may occupy. We must not allow the Lorelei of postwar planning, or any other crusade or catch slogan, to divert us from this terrifying obligation to our fighting men in all parts of the world. *"Let's keep our eyes on the ball"!*

Friction Fighter ROLLER BEARINGS

CARRY SHOCK LOADS WITH FULL-LENGTH ROLLER CONTACTS

Anton J. Haug of Nashua, N. H., selected Friction Fighter roller bearings for his pulp refiner shown above, because he knew these bearings are capable of standing up under the strain of severe service. Weighing 20 tons, the largest of its kind, this machine converts 35 to 40 tons per day of rejects from a chemical pulp mill into high grade pulp. Shock loads and high temperatures under wet, dirty operating conditions are all taken in stride by the three Friction Fighter roller bearing units, as indicated by the arrows above.

Loads are distributed over rollers and races providing reserve capacity, effectively absorbing shock loads and vibration. Inherent self-aligning feature of concave rollers running between convex races permits unrestricted compensation for shaft deflection or misalignment without disturbing bearing load contact so that high load carrying capacity of roller bearing is maintained under all operating conditions assuring maximum durability. Link-Belt Friction Fighter Bearings are available without mountings in both roller and ball types or as pillow blocks and units of cartridge, flange, take-up, hanger and duplex types. Link-Belt Company —Indianapolis, Chicago, Philadelphia, Atlanta, Dallas, San Francisco, Toronto. Branch Offices, Warehouses and distributors in principal cities.

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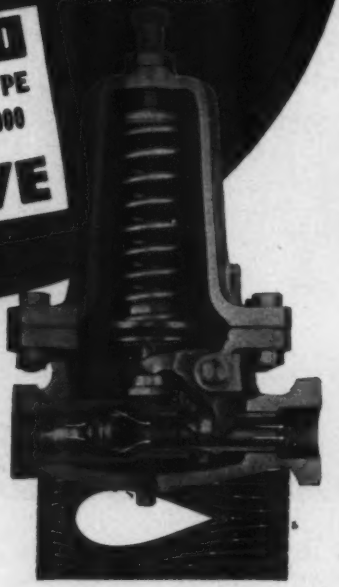
Like Putting Another SKILLED Man on the Job · · ·

CASH STANDARD Streamlined PRESSURE REDUCING VALVE TYPE 1000



● This Streamlined Type 1000 CASH STANDARD Valve has the ability to not only fully and dependably handle the tough jobs, but to stay on the job and not let things get out of hand. In men they call it "skill."

"We have dozens of these Streamliners," writes a user, "and over a four-year period we have not spent a dime for repair parts. We can put one of these valves in an out-of-the-way place and forget about its being there."

Here's another proof of ability — "Your Streamliners hold constant delivery pressure regardless of variations in demand or supply pressure."

Here's one answer to ability—in the Streamliner design there are no small ports and passages or complicated mechanism and but few close fitting parts.

Bulletin 1000 tells the story — send for it.

Streamlined

FOR SMOOTH EVEN FLOW of Steam, Water, Air, Oil, Etc.

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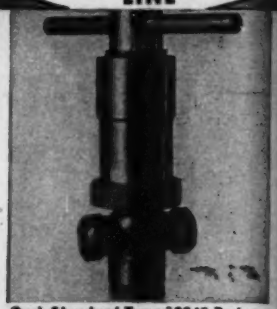
TURBULENCE ELIMINATED

That is why you get maximum capacity when it is needed most and accurate pressure control even in times like the present when production keeps going at a high rate.

You Get All This

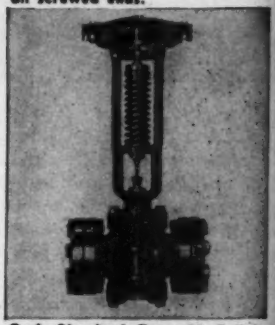
- Trouble-free service
- Smooth operation
- Tight closure
- Accurate regulation
- Elimination of failures
- Constant delivery pressure
- No spoilage
- Practically zero in maintenance costs
- Speedier production results
- Cost saving operation

OTHER VALVES *from the* CASH STANDARD LINE



Cash Standard Type 18245 Reducing Valve handles oil or water under high pressures; maintains constant reduced pressure despite variations at inlet. Bronze body, single seat. Trim is nitralloy or stainless steel. Large T-bar handle adjusts discharge pressure.

Initial pressures to 4000 lbs., reduced pressures 500 to 2500 lbs. Sizes ⅜", ¼", ½", ¾" and 1", all screwed ends.



Cash Standard Type 33 Relief Valve; made with diaphragm or piston action, and of various metals to handle nearly all fluids. As indication of the fine mechanism we point to the roller guides for the valve spindle, and the roller bearing which takes care of spring torsion. Sizes ½" to 3" screwed ends, 1" to 12" flanged ends.

Cash Standard Type 8871 Pressure Reducing Valve; for use with liquids—especially dirty liquids, like Bunker C fuel oil for example. No sliding fits; inner valve bolted to diaphragm for positive movement.

Initial pressure up to 250 lbs., reduced pressure up to 200 lbs. Bodies: iron, bronze or steel. Renewable inner valve and seat ring, stainless steel. Sizes: ½" ¾", 1".

CASH STANDARD CONTROLS.. VALVES

A. W. CASH COMPANY
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Against powerful and resolute foes we can emerge victorious only by being more powerful and more resolute.

But whatever the price, whatever the sacrifice, the cost will be trifling in comparison with the price we would have to pay for disaster.

In line with the entire rubber industry, this Company is cooperating with the Government in every possible way to insure victory as promptly as it can be achieved, and in this emergency it may be impossible for you to secure many of our products for purely civilian needs.

The stake is Liberty — America! Be the cost what it may, the stake is worth it.

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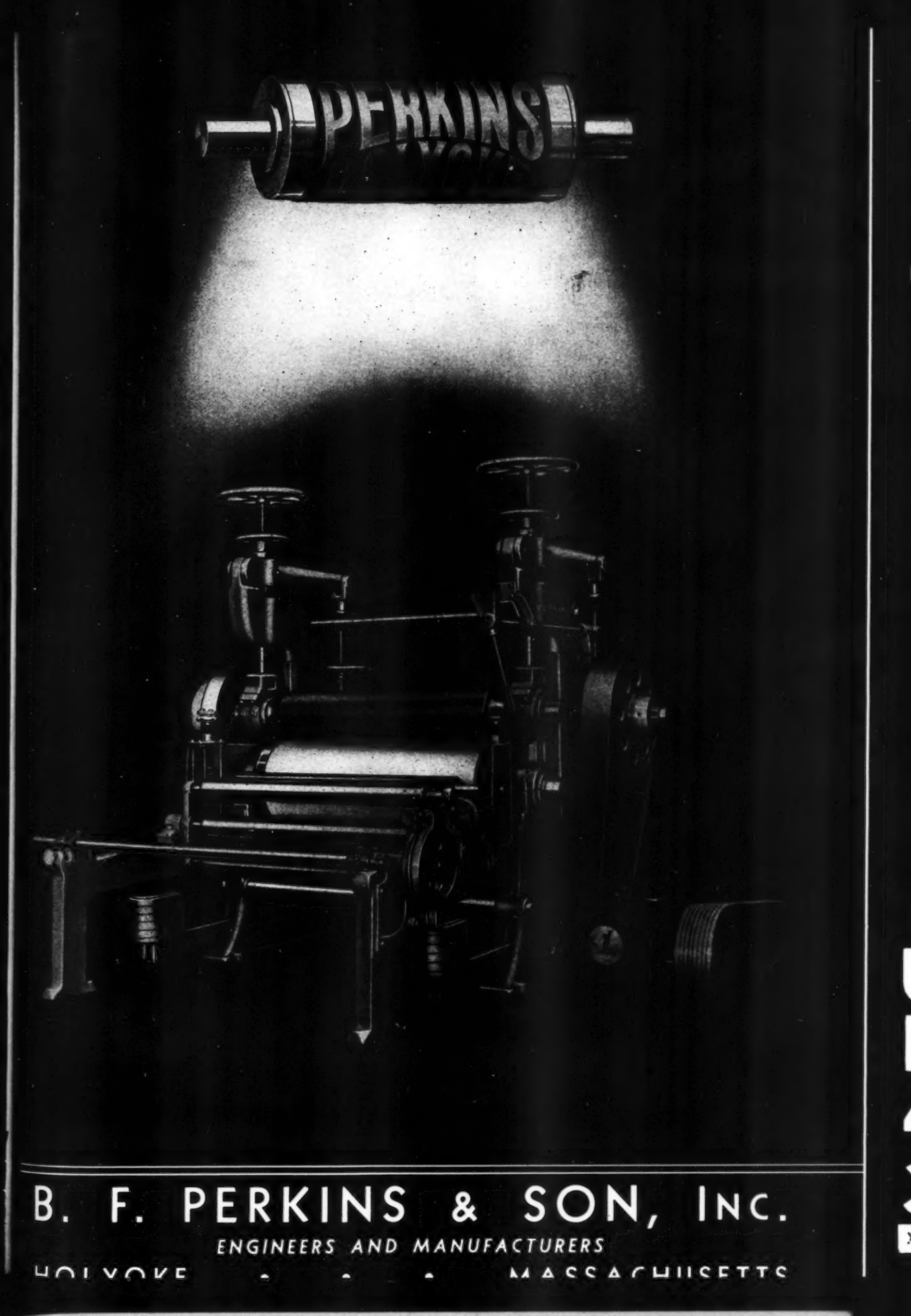

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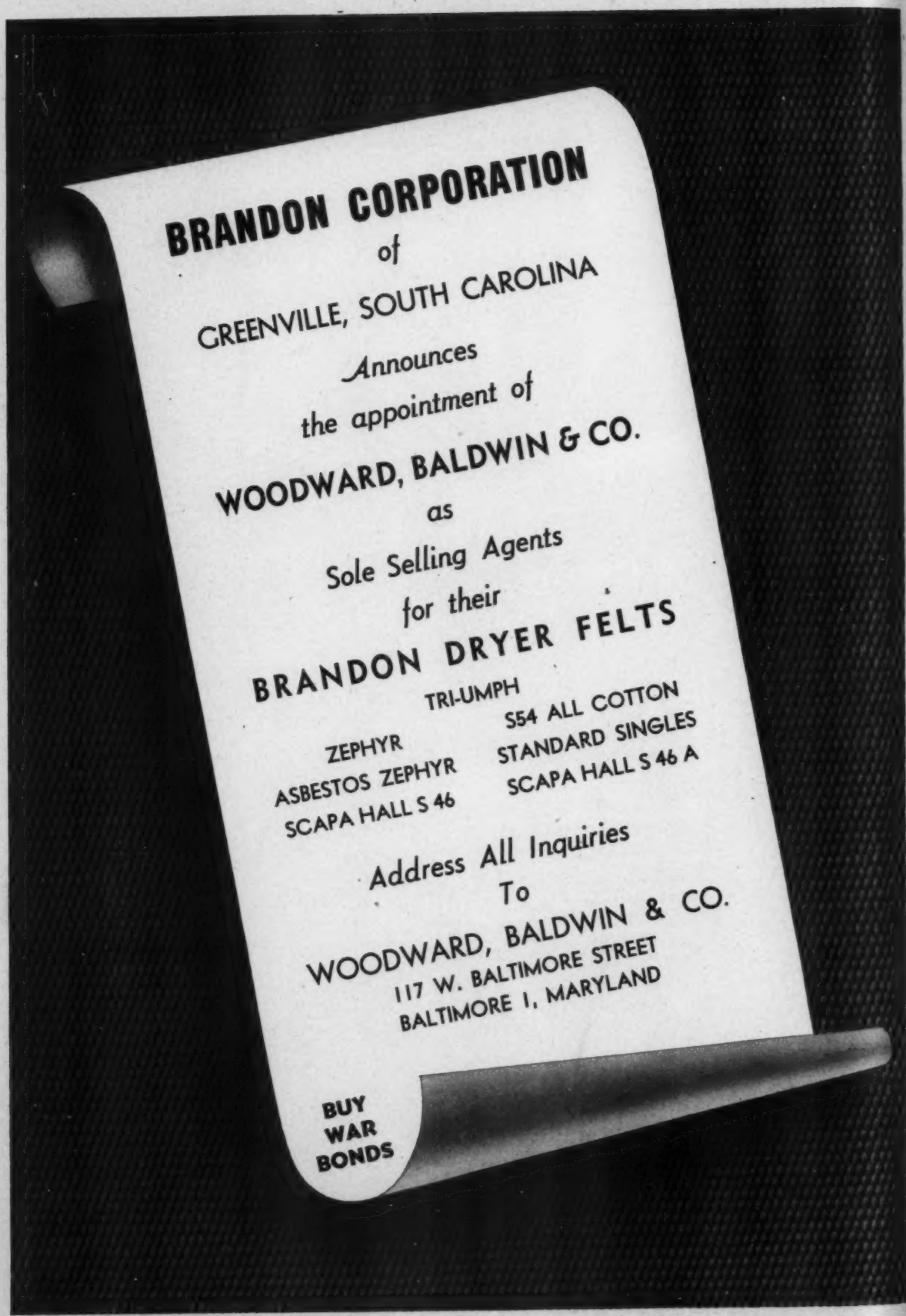
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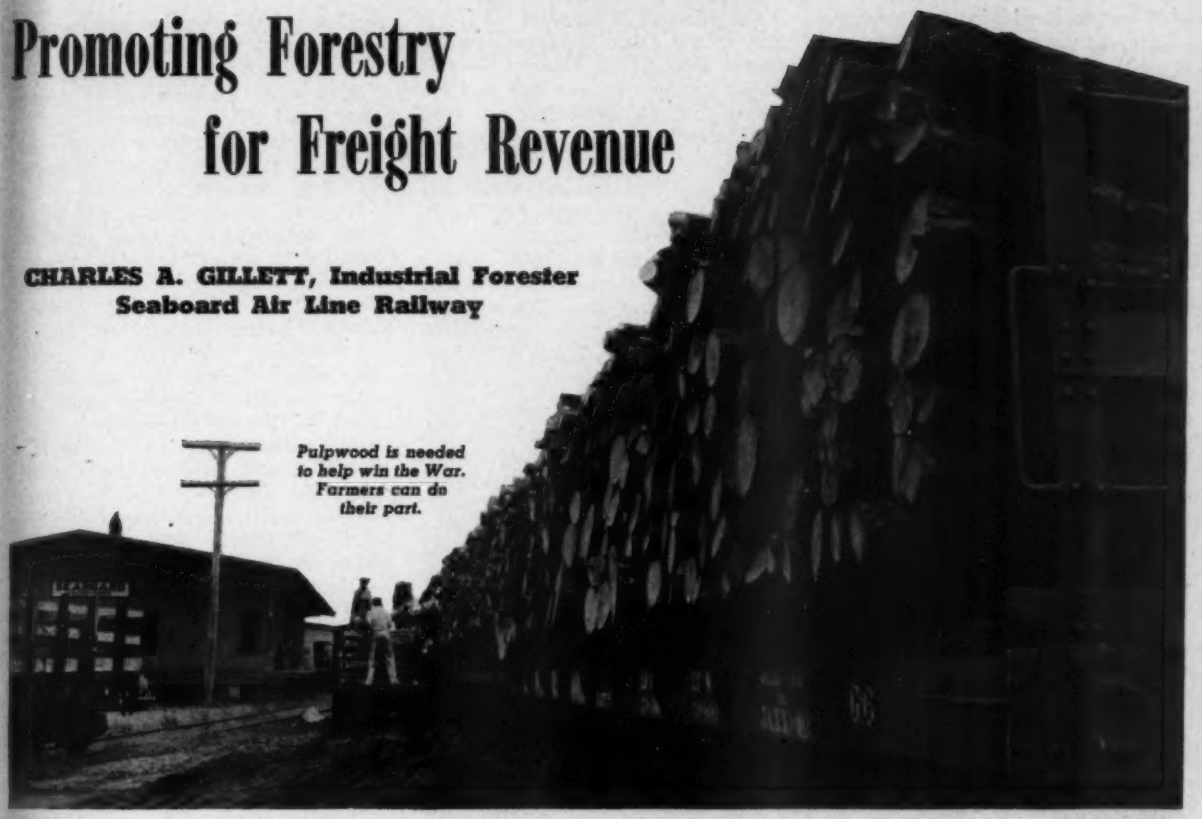


Pulpwood is needed to help win the War. Farmers can do their part.

▶▶▶ THE PULP INDUSTRY OF THE SOUTH probably made more progress along conservation lines during the years immediately preceding Pearl Harbor, than any other user of forest products. Most of the pulp mills constituting that industry employed competent foresters.

These men, skilled in forest utilization, had charge of the acquisition and management of company-owned forests, the purchase of pulpwood from other timber owners, and the co-operative efforts of the mills with timber owners to encourage continuous growing of timber and frequent wood harvests. One pulp company alone had over forty foresters in its employ the day of Pearl Harbor.

Many of these technically trained foresters, as well as others employed outside the wood pulp industry, had taken military training courses while in school. An important percentage of them held commissions in the Reserve Officers' Training Corps. With the outbreak of the War, many of these men were called into service.

As the months of War passed, the problems of the pulp industry multiplied. Government order after government order was issued. The problems of trucks, tires, gasoline, replacement parts, hours, price ceilings, labor supply, became paramount.

To keep abreast of the problems affecting the forests, the Industrial Department of the Seaboard Air Line Railway, made an immediate survey of the pulp situation and of pulpwood supply in the region served by it—from Virginia to Florida. This survey showed an ample supply of raw materials and a satisfactory railroad car situation. Furthermore, it showed that the tire and gasoline situations were being handled adequately by local rationing boards. In some instances, there was delay in obtaining replacement parts, but in this case no assistance could be given by the Seaboard.

Most of the mills were operating on a "car to conveyor" basis and with wood yard inventories sufficient only to last from a few hours to as much as three or four days. The lack of wood caused some mills to shut down temporarily or to shut down one or more paper machines. In the case of one mill, the car loadings and receipts of wood for one month were "off" nearly 2,000 cars.

The need of a campaign to conserve trucks and truck tires was seen immediately by both the American Pulpwood Association and the Southern Pulpwood Conservation Association.

Desiring to do its part, the Seaboard Railway directed its foresty program toward the forest fire situation and toward getting small woodland owners to assist the war effort by making their labor available for harvesting pulpwood.

The farm woodlands in the Southern States produce annually approximately four million cords of pulpwood, or about 55 per cent of the production of the region—an important factor in farm income. In the past, much of this pulpwood has been cut by contractor crews. Labor shortage brought on by the War has affected the number and size of these crews.

Farmers can help to meet this critical pulpwood problem by utilizing their labor and teams in pulpwood production. Such an operation fits in nicely with other farm work. At the same time, it permits the farmers to receive

***EDITOR'S NOTE:** For many years, the Seaboard Air Line Railway has realized the possibilities of the wood pulp industry in the region served by it—from Virginia to Florida. This realization finally caused the firm, in October, 1937, to employ a technically trained forester for the primary purpose of stimulating interest among forest owners, both large and small, in growing timber as a crop. The object behind this move was to assure a continuous supply of timber for all existing and prospective wood using industries of the territory, thus furnishing much tonnage to the railroad and at the same time encouraging a sound economic development for the South. This article relates some of the activities of the program to date.*

labor income in addition to stumpage.

Many of the farm timber tracts are in need of improvement cuttings. Such cuttings not only would help toward Victory, but also would result in a faster growing pulpwood supply for the years ahead when it will be needed.

In the past, some of the pulp mills have had a tendency to overlook the need of maintaining proper relations with small timber growers. Some time ago, the International Paper Company, Georgetown, South Carolina, purchased 1,437,000 seedlings from the South Carolina State Forest Service and made them available to farmers through the Extension Forester of Clemson Agricultural College. Many of the 437 farmers who received these trees were so appreciative that they wrote letters of thanks to the company and are now making pulpwood available to the firm.

Protection of forests against fire is the first and foremost requirement for growing timber under any degree of intensity. The present condition of many timber stands in the Southeast is due primarily to uncontrolled forest fires of the past. The protection of forests against fire, however, is primarily a public responsibility, and the progress of fire protection has been handicapped by lack of public financing.

Nearly five million acres of fee lands are held by the pulp mills of the South. Protection of these lands against fire is a big problem. Pulp mills also are concerned with the protection of other forest lands from fire. These forest lands are now in great danger because forest fire fighting forces have been affected by today's manpower situation.

The Seaboard's wartime forestry program contemplates cooperation with officials of pulp companies and others in forming state-wide organizations and associations to work for better forestry practices within the respective states and particularly for presenting forestry facts to fund-appropriating authorities. Also, it will continue to promote forest protection by using such effective methods as exhibits, news stories, essays and other contests, as well as visual instruction meetings, to the end that timberland owners and others will make voluntary pledges against woods burning and of assistance in actual fire suppression.

Many of the pulp mills of the Southeast as well as extensive acreages of forest properties are located in the "dim-out" area. Naval authorities early recognized the harmful effect of forest fires along the coast. A considerable amount of flying time has been lost due to haze and the "loom" created by forest fires and their smoke.

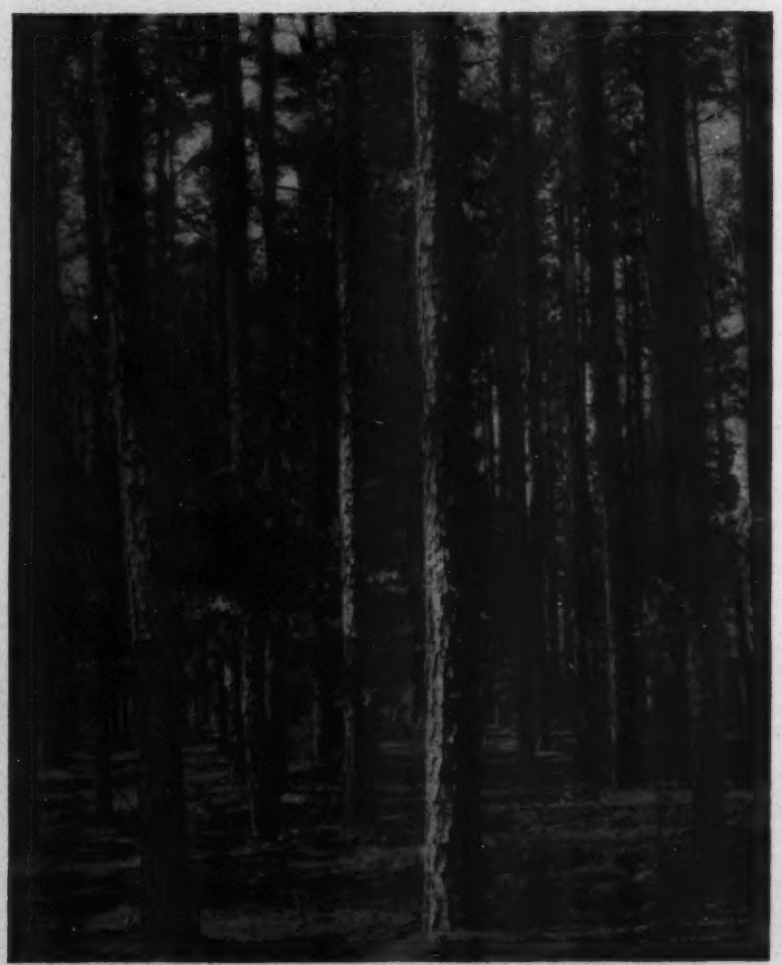
Forest fire smoke can screen enemy submarines off shore from air observation, as well as interfere with the work of our surface vessels in their antisubmarine campaign. Smoke also interferes with training schedules, reduces the visibility and effective range of coast artillery, and disrupts shipping activity in ports by slowing down small boats between ships and shore because of increased danger of collision.

It is said that the glow of forest fires has been seen for twenty miles off shore and has silhouetted ships to make them targets for enemy submarines. In addition, forest fires are a direct danger to military and naval shore establishments, strategic war industries, transmission and communication lines, and forest industries of military importance. Existing perils could well include aerial fire bombing.

Every pulp company needs a long time plan of management for its forest properties and a streamlined organization for handling its wood procurement. This plan and organization is not only desirable now but necessary in years to come. If timberlands are to produce the maximum amount of wood, the same principles must be applied to them as to cotton, corn, or tobacco.

While most of the pulp mills have long time forest management plans, some do not. For some of the mills in this latter group, the Seaboard has made detailed analyses of the pulpwood situation within their territory. This assistance has been given in order that such mills might have technical advice on the approximate amount of land they should own as a backlog, on a recommended forestry program, and on an organization for handling their pulpwood procurements.

The conservation practices recommended by the Seaboard Railway should provide sufficient fibrous raw material to meet existing needs and to meet the anticipated expanded requirements of the future. In view of the almost unlimited uses to which wood cellulose is being put, no other natural resource in the South offers opportunity for such widespread industrial development as the forests.



Farm woodlands of the South contain much timber in need of thinning.

Control Instruments

in Pulp and Paper Production

C. D. DeMERS, Industrial Sales Department
Pulp and Paper Division, Taylor Instrument Companies

▸▸▸ CONTROL OF BOTH PRODUCTION and quality of product during the early development of many present-day basic industries depended almost entirely on the resourcefulness, skill, and physical capacities of the human element. Because of this fact, and due largely to the isolated location of manufacturing plants in small cities and villages, it was but natural for most young men to follow in the footsteps of their fathers. Lack of convenient transportation facilities coupled with a well controlled apprenticeship system made for a relatively small labor turnover.

Under these conditions, the understanding of fundamentals and the skill of the average operator was developed to a much higher degree than is necessary or possible under today's operating conditions in many plants.

While a present-day workman may lack some of the processing skill of his predecessor, he possesses certain advantages from the standpoint of general mechanics because of his early contact with many appliances common to present-day living and working conditions. He also can be readily trained to handle many of the duties involved in the operation of a large and growing industrial plant. However, the present trend toward greater production, higher standards and closer tolerances demand a degree of skill and endurance at some points in the production line that cannot be furnished by the human element. It is to meet this situation that mechanical aids in the form of instruments especially designed for each application are recommended.

The possibilities offered by trained manual labor in the process adjustments and operation of the major production and processing units in the pulp and paper industry may be classified as follows:

It is not the purpose of this article to treat the subject of instruments from the standpoint of present-day conditions, or to recommend ways and means of relieving limited production capacity at some point or points in the production setup. Rather, it is intended to present some general comments on the use of instruments in connection with the processing equipment involved in the manufacture of pulp and paper, and to point out their value for some of these applications. Also, it is hoped readers will be impressed with the fact that the intelligent use and care of instruments during normal times relieves operators of some of their otherwise regular duties and that the economic value of these instruments results from time saving, increased production, more uniform quality of product, and lower conversion cost. —Author's Note.

(1) Manual Versus Instruments — Efficiency; (2) Manual Versus Instruments—Practicality; and (3) Manual Versus Instruments—Capacities.

Included in the first classification are process measurements and adjustments which can be accomplished manually by trained operators but not as efficiently as with the use of instruments. The second classification includes process measurements and adjustments which can be accomplished manually but are impractical from the standpoint of economy. In the third classification are such process measurements and adjustments which are beyond the skill of even the highest trained worker from the standpoint of maximum production and processing units.

Take the control of temperature in the grinding of wood pulp as an example of the first classification. In this case, manual control of a hand valve located in the supply line to the water shower will enable the grinder operator to keep the grinding temperature within fairly close limits of some predetermined value. However, frequent tests must be made of such temperatures, and the valves must be adjusted to correct for temperature variations as indicated by each test reading.

How efficient is this method of temperature control? It can best be judged by considering information compiled from a test made to determine the value of automatic grinding temperature control. This test, lasting for 14 days, was made in the groundwood mill of a well-known Canadian company where very highest standards of grinding practice are maintained under the supervision of two competent groundwood operators.

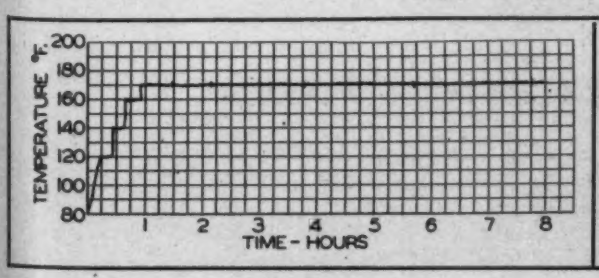


Figure 1

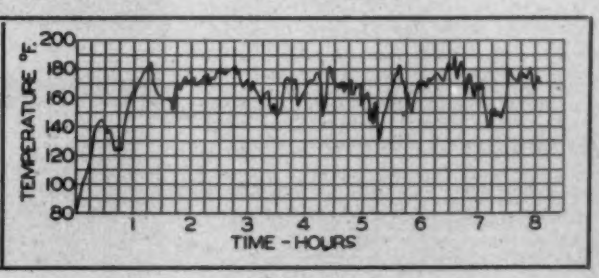


Figure 2

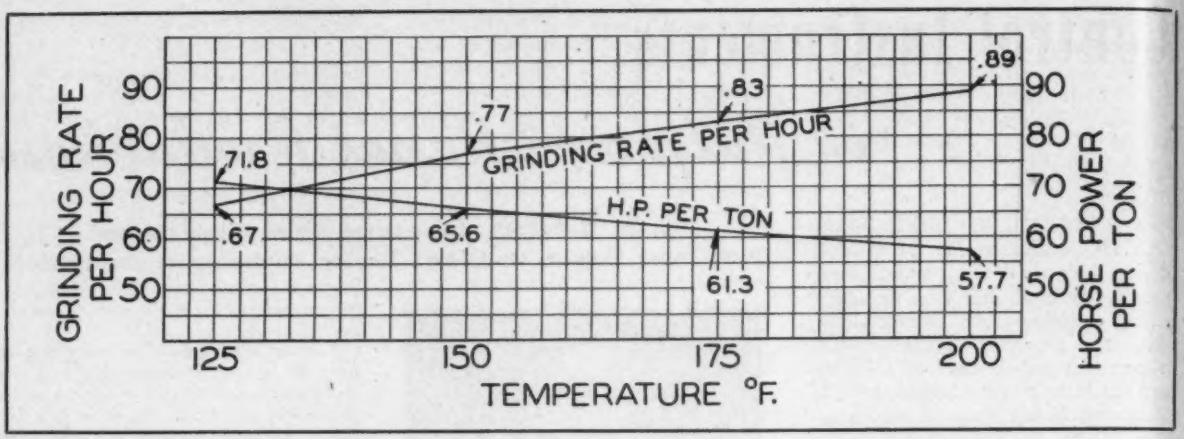


Figure 3

The conditions of the test were as follows:

A line of three pocket grinders driven by a 1,200 hp. motor, each grinder equipped with automatic temperature control equipment for use during the automatic control test period.

A recording watt meter for recording power consumption by the 1,200 hp. motor during the entire test.

Each grinder equipped with a natural stone of good quality—pressure on hydraulic cylinders maintained at 65 lb. per sq. in.

Wood used (spruce)—24 in. long, fairly constant density, carefully racked and measured.

Stone pit samples taken at regular intervals for standard freeness test.

Careful record made of each burring operation.

Tests of 24 hour durations run at different temperatures from 125 to 175 Fahr. Number of tests evenly divided between hand and automatic control of supply line to showers.

Figure 1 represents the average variations in grinding temperature as maintained during the period of hand control; Figure 2; the variations in grinding temperature during the period of automatic control; and Figure 3, production figures and power readings taken during the period of test.

Wide fluctuations from 160 Fahr., the standard at which operators were attempting to maintain temperature during the period of hand control, are recorded in Figure 1. Only slight variations from the standard of 165 Fahr., the temperature at which the controller was adjusted, are shown in Figure 2.

Figure 3 shows that the grinding rate increases and the power input decreases with rising temperature—a clear indication that variations in temperature affect both production and power consumption. Therefore, temperature of grinding always should be maintained at the point best suited to the quality of pulp being produced for each furnish.

How much did the temperature variations recorded in Figure 1 affect production and power consumption? This question is answered clearly by the production figures on Figure 4 and power figures on Figure 5. They reveal an increase of 2.25 per cent in production and a decrease of 6 per cent in power consumption during the period of automatic temperature control over the period of hand control.

Such figures indicate the advantage of instruments in the operation of wood pulp grinders. Not only do they effect a material saving in the operator's time, but they also improve the process. In addition to an increase of 2.25 per cent in production, and a decrease in power consumption of 6 per cent, the stock has a more uniform freeness. Likewise, damage to a stone, caused by wide fluctuations in surface temperature, is eliminated. There also are indications of a lower stone cost due to longer periods between burrings.

An installation covering a well known stock selecting unit is taken as an example of the second classification; namely, Manual Versus Instruments—Practicality. In the operation of this unit, it is necessary to com-

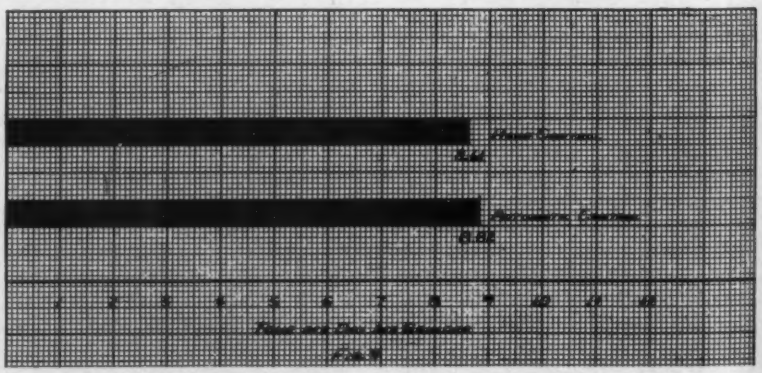


Figure 4

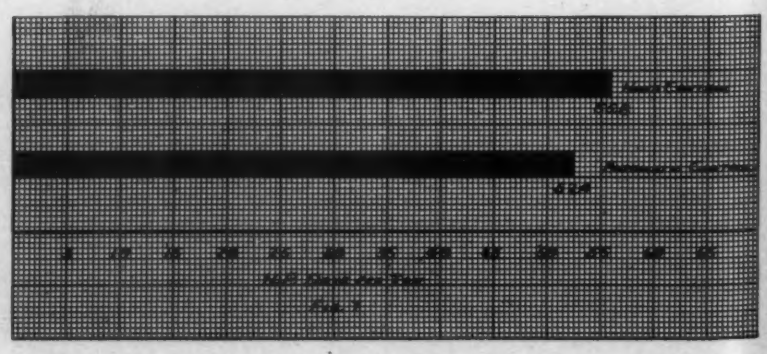


Figure 5

Figure 6

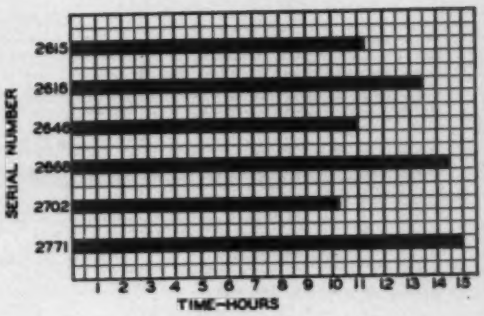
pletely open one stock reject valve for a period of 10 to 15 seconds, then close it at once and repeat the operation every few minutes. A second reject valve also must be opened every 10 to 15 minutes for a period of 1 or 2 minutes. Both of these operations must be performed throughout the entire operating period of the stock selecting unit.

The opening and closing of these two reject valves could be done manually, but such practice would require an operator on each unit and on each tour. The operator would not be available for any other duties. Likewise, it would be too much to expect that he could operate the valves to the close schedule required to obtain a high efficiency in stock selection and the capacity necessary to handle the scheduled amount of stock.

An automatic timing instrument (Figure 6) together with compressed air motors is being used to operate these valves within a few seconds of the prescribed schedule. In this way it is possible for the unit to handle the required tonnage at a high degree of efficiency—another case of considerable saving in operator's time without sacrificing any efficiency in the operation of an important processing unit.

An example of the third and last classification (Manual Versus Instruments—Capacity) is the adjustment of the roll in a standard beating engine. While it is possible for a beater operator to adjust the roll to a point where, in his judgment, the stock is being properly brushed and processed, tests show that roll positioning through manual adjustment is not an accurate measurement of the degree of processing obtained. Further, tests show that roll adjustments to a schedule of pressure as measured by a suitable instrument can obtain the desired results with greater uniformity and in a shorter period of time.

Figure 8 →



In a plant using bleached sulphite pulp in the production of high grade specialties, the beater operators were instructed to adjust the rolls manually in the usual way. The actual roll pressure was recorded by an instrument developed for this purpose. During the test period of several weeks, no effort was made to change the routine operating practice; and each beater was dumped to a definite measure of freeness.

The roll pressures as recorded during thirty typical beating cycles were plotted to determine any variations in roll pressure and beating time. A difference of 4,400 lb. pressure was shown between two consecutive beating cycles, a variation of over 200 per cent, although the roll was adjusted in accordance with the usual procedure in each case. Figure 7 brings out the wide variations in roll pressure of five typical beating cycles during this test period.

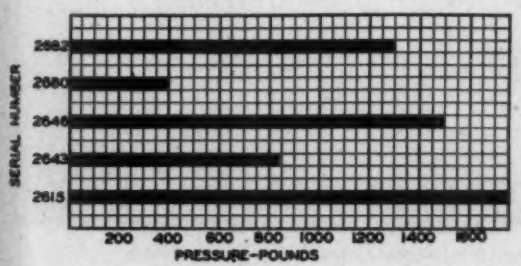
In order to check the effect of variations in roll pressure on beating time, the length of the same several beating cycles were plotted. Again the variations were excessive. There was a difference of approximately 4¾ hours between the shortest beating cycle (10¼ hours) and the longest (15 hours). Figure 8 shows a variation of nearly 30 per cent in beating time.

With the data compiled from these thirty beating cycles, a tentative schedule of pressure and time was laid out, and the rolls were adjusted in accordance with this schedule. After a few trial runs, a definite schedule was established by modifying the tentative one. Use of this definite schedule resulted in a reduction of beating time of approximately 1½ hours from the average of the thirty beating cycles, and reduced the variations in beating time to an average of approximately 30 minutes (Figure 9).

In another plant, where the rolls were adjusted manually to a definite position, figures were obtained on both beating time and power consumption. This test covered a period of seventy beating cycles—thirty-five with the roll adjusted to position, and thirty-five to a schedule of pressure and time. A record of power consumption was kept during the entire test period. All beaters were dumped to a definite freeness, and all figures on beating time and power consumption were checked carefully and recorded. At the end of this comprehensive test, the results were analyzed and plotted. Again the importance of roll pressure recording instruments was demonstrated clearly (Figures 10 and 11).

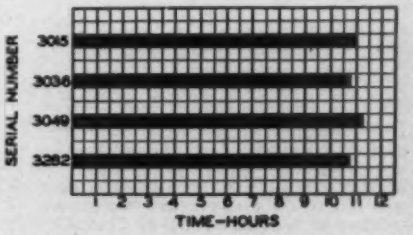
In this test, the average beating time under manual adjustment to a definite position was 13.61 hours; while, under roll pressure by the use of the recorder, it was 12.95 hours—a saving of 4.8 per cent in beating time. Under roll position adjustment, the average hourly power input was 11.09 kilowatt hours; under roll pressure adjustment, it was 10.48 kilowatt hours—a saving of 5.5 per cent in power.

The use of instruments for controlling the beating operation, therefore, has brought about a reduction in beating time with incident increase in beater capacity, a reduction in power



← *Figure 7*

Figure 9 →



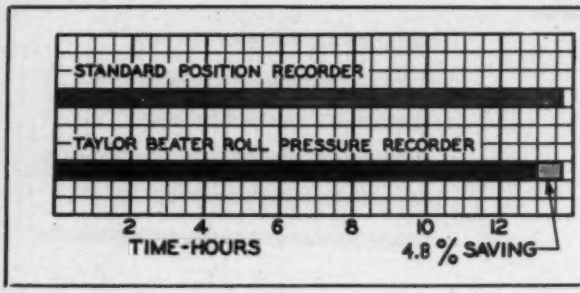


Figure 10

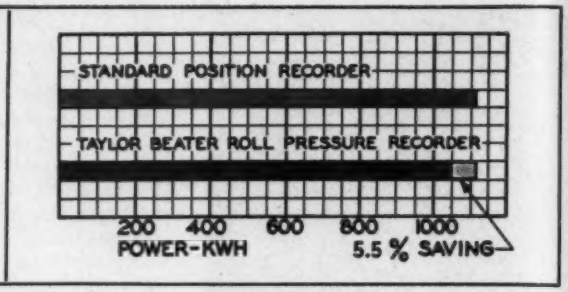


Figure 11

consumption, and a reduction in drying cost on the machine together with a definite saving in time of the beater operators.

Are instruments important from the standpoint of time saving, increased production, more uniform quality of product, and a lower conversion cost? It is believed that the few case studies which have been cited prove that they are; and further, that the economic possibilities suggested by the tests reviewed warrant the fullest consideration of every plant executive in the industry.

SAFETY SHOES *in the Paper Industry*

HENRY G. LAMB, Safety Engineer
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▶▶▶ A PAPER MILL that does not wish to make the wearing of safety shoes compulsory, can find many methods short of "work or fight" that will make the employees so conscious of protecting themselves against foot injuries that they will wear steel toe caps of their own accord. Many of the following ideas have been used by the Scott Paper Company, Chester, Pennsylvania, during four years of experience in preventing such accidents. It is not claimed that any of them are original, but some of them may not be known generally or used widely throughout the paper industry.

In almost any plant, it should be easy enough to determine the percentage of foot accidents by checking the last 100 lost-time accident reports to see how many of them show foot injuries, particularly broken toes. In 1941, the National Safety Council made an extensive study of accidents in the pulp and paper industry, and one of its reports showed that out of 140 accidents from trucking operations, more than 7 per cent were caused by "failing to wear safety shoes."

Steel toe caps also prevent accidents in the operating and repairing of machines, the handling of shafts and cores, and also in handling materials such as logs, blocks, bales, and rolls of paper. Machine tenders themselves now admit that it is not practical to work barefooted as was the custom years ago, and more and more of these men are realizing the genuine protection afforded them by strict adherence to the wearing of steel toe caps.

In the beginning of its campaign, the Scott Paper Company adopted the policy that a stock of safety shoes would be kept at the plant. The supply was kept near the locker room, and an attendant was available so that shoes could be purchased at any time of the day or night. The company purchases the shoes direct from the manufacturer, and they are sold to the employees at cost. All expenses of handling and selling the shoes at the plant are borne by the company. At a session of the Greater New York Safety Conference in 1941, the question was asked as to how many plants paid part or all of the cost of safety shoes. From raised hands of plant representatives, it was evident that about 40 per cent contributed some part of the cost of the shoes, but none of them provided the employees with shoes free of charge.

Another important factor in the Scott Paper Company's program was

Safety shoes reduce foot-accident hazard in pulpwood handling.

EDITOR'S NOTE: The photographs used with this article were supplied through the courtesy of the National Safety Council.

Feet not protected with safety shoes might be crushed by the weight of falling boxes.

that the men themselves would determine what sizes, styles, and brands of shoes would be kept in stock. This was worked out through the following procedure: At first, shoes were obtained from several different manufacturers and all were given a fair trial by the men. Replacement purchases, however, showed a preference for shoes from two of the manufacturers. After further experience with styles and sizes, it was found that by keeping a stock of about 200 pairs of shoes, adequate service could be provided for 1,000 men in all operations. With this supply, it was seldom that an employee could not be fitted direct from stock. And by the addition of a payroll deduction system, the purchase of these shoes was made very easy.

As new manufacturers and new styles of shoes were developed, these also were tried out by the men and the same criterion was applied: "If the men will wear them, the company will keep them in stock." The justification of carrying stock from at least two manufacturers was clearly brought out in the case of Bill T——. Bill was a cheerful, willing worker, and he wore safety oxfords just as regularly as he punched the clock. One day he showed up in the First Aid Dispensary with a blister on his heel. He was breaking in a new pair of safety shoes, and with proper medical attention for the blister he felt that the shoes soon would be "broken in" and everything would be all right again. But a couple of days later the blister was bigger and more painful. It was beginning to get Bill down and definitely something had to be done. He was told to take the shoes back to the manager of the locker room, who had had the most experience in fitting these shoes, and see if anything could be done. Later that day Bill was his cheerful, smiling self again, and his blisters actually healed while he was breaking in another pair of safety oxfords. He had been fitted with a pair of identical length and width, but made by a different manufacturer.

When the company first started selling safety shoes there was no retail outlet in the community that supplied them, nor was there one even interested enough to enter this field. As the shoes became more popular, several stores began to carry steel-toe shoes, and the company policy was established that the main objective was to get the men to wear the shoes, no matter where they were purchased. As a result, the employees were told about these stores, and any man who desired to purchase from the retail outlets was encouraged to do so.

There seems to be a deep seated trait in human nature to "practice what you preach." No matter whether it be the safety engineer, a foreman, or even a fellow employee who starts to talk about safety shoes, invariably the listener will immediately look to see if the speaker is actually wearing this protection himself. Needless to say the safety engineer should wear steel toe caps at all times, and the supervisors also will find that by setting a good example it will be much easier to get their workmen to wear safety shoes.

The question sometimes comes up: "Can safety shoes, as they are now made, be worn by everyone?" If for any reason an employee has gained the impression that these shoes will make corns or bunions on his feet, he is entitled to a reasonable answer. This was handled in the following manner:

The plant's medical department recommended a chiropodist who was a specialist in foot problems. This man was brought to the plant, shown the different styles, shapes, and sizes of shoes that were carried in stock; he was also taken on a tour of the plant so that he could observe the conditions under which these shoes must be worn. From there on any employee who thought these shoes would hurt his feet was sent to the chiropodist at the company's expense. The employee's feet were examined and a report was

A safety shoe often prevents injury to a foot.

made showing their condition at that time, and recommending the size and style of safety shoes he should wear. The employee was then assured that if he had any trouble with his feet from wearing the safety shoes the company would take care of him. There were other cases where employees purchased shoes in the regular way but later complained they did not fit or could not be worn with comfort. Here again an inspection and report by the chiropodist almost invariably solved the problem and prevented an argument.

Perhaps the most effective time to sell an employee on wearing safety-toe shoes is when he is first employed. The proper induction of a new employee should answer all his questions as to why he should wear these shoes, where he can obtain them, and how much they will cost. He should be given information on their construction so that he can have confidence in them. Perhaps he does not know that even if the metal cap is bent, it can be easily lifted off without injury to his toes. He will be particularly interested in knowing the details of the payroll deduction system and who to see or what department to go to in order to make his purchase.

The sale of safety shoes, like that of candy bars or cigarettes, can be improved materially by effective publicity. A satisfied customer is not only important because of the protection to his own toes, but also because of the effect he can produce on his fellow employees. A display window in the locker room may be used to show the different styles of shoes that are available or to show a dented shoe together with the story of how it prevented a broken toe, including the date and name of the employee who was wearing it. The plant's news organ and the bulletin boards also can be used effectively to announce new styles of shoes as they are made available or to show the picture of one of the boys and the work he was doing when his pair of shoes saved his toes.

Early in the war effort the need for preserving manpower and preventing accidents was recognized by the Government and when the WPB gave consideration to the steel used in safety-toe caps it was agreed that it was important to maintain this protection for industrial employees.

Safety Shoes (Use and Care)

1. Wear safety shoes to protect your feet against falling objects.

2. Select the proper type of safety shoe for your job; styles available include anti-spark, anti-slip, molders, oil-resistant acid-resistant, shock-resistant and wooden sole.

3. Be sure you get a comfortable shoe; a good fitting shoe will not cramp or chafe your feet on the job, and it will wear longer.

4. Keep shoes in good repair, worn-out soles and run-down heels are dangerous. You will save money by replacing them before they cause an accident.

5. Clean your shoes frequently; dress the leather with neatsfoot oil or a good grease or polish; avoid getting oil or grease on rubber parts.

6. Keep your shoes as dry as possible; if they get wet, dry them very slowly—wet leather will be damaged by heat greater than your hand can bear.

7. Wash your feet and change socks daily; perspiration harms the leather and causes the lining to wear out and become rough.

8. Wear heavy cotton or wool socks which absorb perspiration better and wear longer than thin lisle, silk or rayon socks.

9. Avoid stepping on, or kicking against, sharp metal, scrap, or other material which will damage your shoes or injure your feet.

(The above is reproduced from N.S.C. Safety Instruction Card No. 530. These rules do not apply to conductive shoes.)

Substitutes for Nonfibrous Chemical Raw Materials

E. N. POOR, Technical Director, W. C. Hamilton & Sons

▶▶▶ INCREASING GOVERNMENTAL DEMAND for nonfibrous chemical raw materials used in the manufacture of paper has brought about an important need for substitute products. The chemical producers have met the challenge of total war by unprecedented increases in production; but, in spite of this fact, the demand for substitutes is appreciable. Furthermore, since the scope of the war effort has affected substantially all ma-

AUTHOR'S NOTE: The purpose of this article is not only to suggest alternate nonfibrous chemical raw materials but also to stimulate research efforts concerning them. While a fundamental knowledge of the practical applications of such products permits maintenance of existing productive processes and increases paper versatility by the development of new types, it also paves the way for an immediate expansion in the use of available materials after the conflict. A full realization of this fact cannot help but strengthen materially the present and postwar position of the pulp and paper industry.

The development of standards for protective occupational footwear was undertaken by the American Standards Association in response to requests received from WPB and OPA. These governmental agencies indicated that it was necessary to provide protection to the wearer, conserve critical materials during the war effort, and provide a floor level of quality in order that shoes can be effectively priced.

Under American Standards war procedure, a committee of technically competent individuals was formed to prepare these standards. The committee included representation from the shoe manufacturers, the employers or users of the shoes, the insurance groups and the interested governmental agencies. This project has gone considerably beyond just the steel toe caps and already American War Standard specifications for protective occupational footwear have been approved for men's safety-toe shoes, men's conductive shoes, men's explosives-operations (non-sparking) shoes, men's electrical-hazards shoes, men's foundry (molders) shoes, and women's safety-toe (oxford) shoes.

The committee is also working on standards for other style of women's protective occupational footwear. It is anticipated that these standards will be given due consideration in any limitation order of WPB or any price regulation of OPA which may affect these items.

terials, the general problem is to find less critical substitutes rather than unessential ones.

The search for such materials involves a technical analysis of the various chemical and physical properties exhibited by each of the limited materials for which substitutes are being sought. Specifically, those properties of a given material for a particular application must be determined. In most cases, it is found necessary to single out the predominating property in order to facilitate the selection of alternate materials.

A survey of the literature may disclose several possible substitutes. At this point, the relative essentiality of each of the possible substitutes must be determined. This information can be obtained through contacts with consumers, from the manufacturers of the chemical materials, or from the Conservation Division of the War Production Board.

Most substitute materials undoubtedly will be restricted. Generally, however, one or more of them may be found to be available in amounts sufficiently large to warrant substitution, providing distribution facilities are adequate.

With this information in hand, the laboratory should make comparisons of each of the selected substitute materials with the more critical material for which it is being considered to augment or replace. If the results are promising, the extent of possible substitution should be evaluated. Likewise, consideration must be given to any deleterious factors, such as corrosion, which might arise after prolonged usage.

If everything is satisfactory up to this point, the material under study is ready to be introduced into the production process. To minimize impairment of paper quality, it is necessary to carry out this work under exacting chemical supervision.

Throughout several trials, the various limitations and required changes in technique should be recorded for the use of the production department, and a cost analysis should be prepared for the approval of the management. From then on, technical control must conform to the limitations of personnel.

The accompanying list of nonfibrous chemical raw materials, selected without consideration as to cost, catalogues some possible substitute products for a number of commonly used materials. Some of the suggested substitute products, designated by an asterisk, are fairly obtainable at the present time. The other products may find extended applications in the papermaking industry after the War.

Nonfibrous Papermaking Raw Materials

Service	Basic Materials	Substitute Materials
Mineral Fillers	Clay	Talc* Calcium carbonate Diatomaceous earth Calcium sulphate Barium sulphate Ground feldspar* Pyrophyllite* High silica bauxite*
	Titanium dioxide	Zinc sulphide Lithopone* Titanated lithopone Magnesium oxide
Bleaching agents	Chlorine	Sodium chlorite Sodium peroxide Potassium permanganate Oxalic acid
	Sodium hydrosulphite	Sodium sulphite Sodium bisulphite Zinc sulphoxalate Titanous compounds
Sizing agents	Starch	Sodium silicate* Glue* Casein* Soybean protein Corn flour* Synthetic resins Gum karaya Methyl cellulose Egg albumen
	Glue	Soybean protein Starch Synthetic resins Casein
Tanning agents	Formaldehyde	Alum* Chrome alum Furfural Acetaldehyde Quinone
Flocculating agents	Glue	Tall oil soap Fatty oil soap Rosin soap Sodium aluminate Caustic soda Sodium alginate Magnesium sulphate
Adhesives	Animal glue	Fish glue Starch Vegetable dextrines Casein Synthetic resins Methyl cellulose Wheat flour Sodium silicate
Mordants	Alum	Sulphuric acid* Ferric sulphate Aluminum chloride Sulphur dioxide (for pH control)*
Plasticizers	Glycerine	Invert sugars Apple syrup Sorbitol Glycols Lactates Phthalates Quartenary ammonium salts Sulphonated fatty oils
Defoaming agents	Kerosene	Sulphonated tallow* Emulsified tallow* Aromatic organic solvents Primary alcohols Mineral oils*
Fungicides and Bactericides	Chlorine-Formaldehyde	Phenolic compounds Chloro-phenolic compounds Mercury organic salts Copper sulphate Zinc sulphate Sodium benzoate Hydroxy benzoic acids Cresols Napthols Chlorinated aromatics
	Naphthalene (mothproofing agents)	Para dichlorbenzene Silico fluorides* Rotenone Chlorinated substantive compounds
Detergents	Soap	Silicates* Sulphated alcohols Sulphated fatty amides Sulphonated petroleum derivatives Solubilized pine oil and other solvents
	Tetra-sodium pyrophosphate	Metasilicates Tetraphosphates
Fireproofing agents	Sulphamic acid derivatives	Silicates* Lead sulphate* Zinc oxide* Borax* Chlorinated paraffin Ammonium chloride Aluminum acetate

(*) Indicates materials which are fairly obtainable at present.

The Nature of Hydration and Fiber Bonding*

JAMES d'A. CLARK
The Institute of Paper Chemistry

▸▸▸ IN THE DISCUSSION OF the nature of hydration and fiber bonding, in addition to the recent work of Heuser (*1*) on the chemical and physical structure of cellulose and that of Stamm (*3*) on its colloidal properties, two aspects of the problem deserve further comment. One is the nature of the adhesive bonds between adjacent cellulose molecules; the other, the properties of the exterior fibers and their exposed surfaces.

Partial Solubility

Urquhart (*4*) advanced the hypothesis that, during the formation of cellulose, a precipitate is formed in the presence of water and, hence, the hydroxyl groups of cellulose would have molecules of water attached. As the fiber dries, the hydroxyl groups are freed from water and their residual valencies are mutually satisfied by adjacent cellulose molecules, thus causing secondary valency bonds to form. When again wetted, some of these bonds are broken and some hydroxyl groups reattach themselves to water, giving a looser form of structure. He also advanced the idea of "partial solubility" of the cellulose in water.

This concept was extended by Campbell (*2*), who suggested that, because of this "partial solubility," the molecules of cellulose on the surface of a

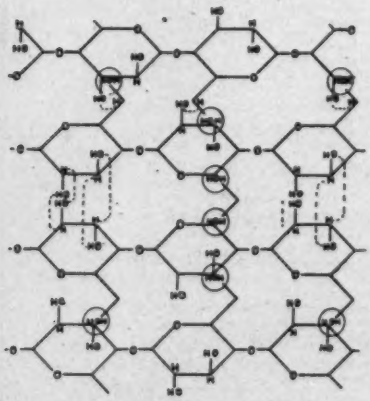


Fig. 1—Diagrammatic arrangement of cellulose chains showing different types of linkages.

fiber in water were endowed with a freedom which enabled the molecules of adjacent fibers so to orient themselves that, upon drying, many of their hydroxyl groups could bond together. He also showed by calculation that (especially with the finer fibrillae), as the water is removed, surface tension causes very large compacting forces to be brought into play, which would also serve to increase the surfaces in contact. This process of bonding, akin to the phenomenon of crystallization, was at variance with Strachan's original explanation of bonding as being caused by an intertwining of the fibrillae and was attacked by him (*5*). However, Strachan's grounds for argument on this point became very weak after the writer published his findings (*6*) regarding the surprising strength developed by the bond formed when two sheets of untreated cellophane were wetted, pressed, and dried together, and where no fibrillae, in the ordinary sense, could be presumed to be present.

In further support of the "partial solubility" theory, it may be noted that Wislicenus and Gierisch (*7*) found that, after breaking down cellulose particles by very fine dry grinding, 0.05 to 0.39 per cent of the cellulose (in the case of quantitative filter paper) became soluble in water and, because the amount of ash in the dissolved portion was little more than that in the original paper, it was clear that some cellulosic material had dissolved. They found a marked increase in the copper number and Methylene blue adsorption of the dissolved material, indicating that the degree of polymerization of the dissolved material was reduced and, possibly, that some carboxyl groups had been formed; it is doubtful, therefore, if much of the material in solution was actually cellulose.

Recently, Strachan (*8*) published data to show that appreciable, though very small, constant quantities of material (from 13 to 21 ppm) were dissolved by cold water from a carefully purified cotton cellulose even after as many as 50 extractions with water, a stirrer being used for mixing. He noted, when the solution was evaporated, that the residue was white, soluble in water, and had a reducing action equivalent to about 15 per cent of its weight of glucose; however, glucose as such was not detectable.

In a discussion of Strachan's paper, Turner (*9*) told of experiments he had carried out with a highly purified cotton fabric dipping in conductivity water. A brown line was formed where the water evaporated, consisting of material which was soluble in water and alcohol and which possessed a considerable reducing power. The brown line could be re-formed at lower and lower levels on the same piece of cloth with undiminished intensity, indicating the possibility of oxidation or other modification of the cellulose under these conditions, which rendered the affected molecules water soluble.

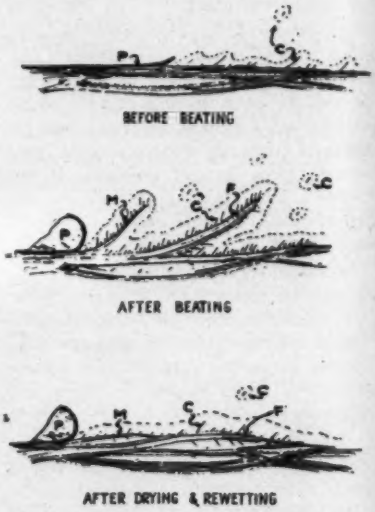


Fig. 2—Diagrammatic cross section of edge of wood fiber. P—Primary wall; C—Cellulose molecules; M—Micelle; F—Fibrilla; ····—Boundary of oriented water.

Despite the above, however, the case for the solubility of minute quantities of cellulose in water is not wholly proven, because it is extremely difficult to purify cellulose thoroughly without at the same time producing some degradation. Further work to establish definitely the fact that pure cellulose has a measurable solubility in water appears to be desirable.

The Effect of Esterification and Etherification on Pulps

Partially methylated fibrous cellulose, having from 0.7 to 2 methoxyl groups per glucose unit (depending on the degree of uniformity of the methylation and the degree of polymerization), is soluble in cold (though not in hot) water; the completely methylated (trimethyl) cellulose is hydrophobic, as would be expected.

During the last few years, considerable attention has been paid to the

(*) Paper read by James Strachan before the Forty-fifth General Conference of the Technical Section of The Paper Makers' Association of Great Britain and Ireland which was held in London (England) on March 18, 1943.

hygroscopicity and the strength characteristics of pulp after etherification to different degrees. Jayme and Froundjian (*10*) showed that, by the introduction of about 9 per cent of methoxyl, the bursting strength of the resulting pulp increased by about 50 per cent and the hydrophilic nature of the pulp similarly increased. Bletzinger (*11*) found that when rag half-stuff was partially acetylated to the extent of about 6 per cent of acetyl groups and when degradation was minimized by using pyridine as the medium for the mixture of pulp and acetic anhydride, the bursting strength of rag pulp (using water as the forming medium) increased by about 10 per cent and thereafter, as the degree of acetylation proceeded, the strength of the sheets progressively decreased to almost zero. If the fairly completely acetylated pulp was disintegrated and formed into sheets in acetone (in which the material is said to be "insoluble," because its high degree of polymerization had been maintained), a sheet strength was obtained many times that of the unacetylated pulp similarly disintegrated and formed in water.

Brown and Harrison (*12*) studied the effect of acetylation on unbleached kraft pulp. They did not observe the rise reported by Bletzinger but found a rapid decrease in strength with increasing acetyl content. It seems probable that their acetylating conditions were different and not as mild. As Chippindale (*13*) has demonstrated, under more drastic conditions, the exterior of the fibers very likely would

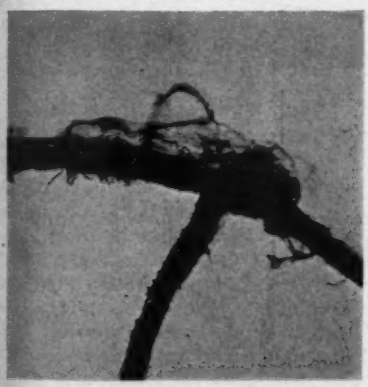


Fig. 3—Bleached sulphite after two hours' disintegration and partial silvering.

be preferentially acetylated. The effect of impurities present in the kraft pulp or their removal during acetylation may also have had some effect on their results.

Aiken (*14*) recently confirmed Bletzinger's work and found that the strength of partially acetylated pulps rose appreciably. He obtained an 80 per cent maximum increase in the burst of a rag stock with about 3 per cent of acetyl introduced under very mild conditions, and a maximum increase of about 10 per cent in the case of Mitscherlich sulphite pulp containing about 5 per cent of acetyl groups, after which (as others have noted) the strength fell off rapidly. Upon beating

Fig. 4—Tangential view of edge of unbeaten spruce fiber.

the well-acetylated pulps in acetone and forming a sheet in the same medium, a very much stronger product was obtained than by beating the unacetylated pulp in water. He obtained similarly shaped curves for the development of the properties of the sheets upon beating the normal pulp in water and the acetylated pulp in acetone.

Because of the above and also the easily demonstrated fact that a mat of finely cut acetate rayon fibers will bond tightly together if washed with alcohol (in which they are also "insoluble"), well-acetylated material appears to be more "partially soluble" in acetone or alcohol than normal cellulose is "partially soluble" in water and the degree of solubility of the fibers in the forming liquid appears to be an important factor.

The Nature of the Cellulose Bonds

The various phenomena of the solution of cellulose compounds in water, possibly excluding the results of Wislicenus and Gierisch (which may have been caused by a mechanical cleavage of the long chains of normal cellulose to give soluble oligosaccharides), all have the following interesting possibility in common.

As is now recognized, there are present in the structure of the cellulose molecule three free hydroxyl groups per glucose unit, two of which are secondary and one primary. These are shown in Figure 1, which is a diagram of adjacent cellulose chains which may belong to the same or to adjacent micelles. The linkages between each pair of chains are shown as being different from those of other pairs; obviously, there are a number of other possible variations of the linkages, depending on the orientation of the various chains in the micelles or of the micelles themselves. What the alignment and position of the chains may actually be does not affect the following hypothesis: The strongest and the most water-resistant bonding between adjacent chains is caused entirely by the linking of the primary hydroxyl groups of one chain to the hydroxyl groups (either primary or secondary) of the other. Consequently, the structure will become loosened and will become either partially or wholly soluble in water if the primary hydroxyl-hydroxyl bonds are removed by adding a methyl, acetyl, carboxyl, or any other group to the cellulose in sufficient quantity to engage preferentially the majority of the primary hydroxyl groups. If the main bonds are thus disturbed, there are enough remaining secondary hydroxyl groups to allow the structure to remain hydrophilic and be dispersed or partially dispersed in water; how-

Fig. 5—Tangential view of edge of beaten spruce fiber.

ever, if methylation or acetylation or the addition of other similar hydrophobic groups extends to the majority of the secondary hydroxyl groups, then the structure becomes hydrophobic—i.e., insoluble in water but more soluble in organic liquids. The introduction of additional carboxylic or other hydrophilic groups (if this is possible)

of course would not affect the hydrophilic nature of the product.

Because of the spatial construction of the cellulose crystal as deduced from X-ray work, it would seem that the primary hydroxyl groups are the more likely to be involved in the bonding between adjacent cellulose molecules. It is also well known that primary hydroxyl groups, in general, are considerably more reactive than secondary ones. It seems only reasonable to suppose, therefore, that in the partial methylation or acetylation of cellulose, the primary groups (statistically at least) are the first to react. The work of Gardner and Purves (*15*) lends support to this contention; in a study of the reaction of acetone-soluble acetates treated with tosyl chloride (*p*-toluene sulphonyl chloride) and then with sodium iodide, the rate of tosylation of the primary groups was about twelve times that of the secondary groups during the initial stages. It would appear that, if a few carboxyl groups are formed by oxidation or even if a strong secondary valence attraction existed between any carbonic acids present and the hydroxyl groups, as might be assumed as having occurred in the experiments described by Strachan and also by Turner, the association is likely to be concerned, for the greater part, with the primary hydroxyl groups only. This, and perhaps in addition some reduction in the chain lengths of the molecules by oxidation, would render the cellulose molecules completely water soluble. The solution of cellulose in cuprammonium solution and zinc chloride and its enhanced swelling in other salt solutions possibly may be effected by a loose chemical combination of the salt with the primary hydroxyl groups. Hess and Trogus (*16*), among others, believe that there is a chemical reaction between cellulose and cuprammonium hydroxide.

Fig. 6—Lightly silvered sheath material.

In considering the possibilities of the formation of a surface colloidal solution, it seems reasonable to assume that it would take the form of a two-dimensional colloidal suspension or solution on the exposed surfaces of the cellulose, whereon the chains or micelles, having their main lateral bonds broken by mechanical or chemical action, would form what might be called an anchored suspension in water. This envisages the surface colloidal solution to be, on a much smaller scale, like the pile on a piece of coarse velvet dipped in water. If the molecules were too long to pass into true solution, they could very readily be imagined, as Campbell has suggested, to have one end adhering to the body of the fiber and to have their main length surrounded entirely by water. As the surfaces are strongly hydrophilic, the water molecules adjacent to them would be completely oriented and immobilized, with the orientation of the successive layers of water molecules being less marked and, incidentally, the density of the innermost layers of water greater than normal. These layers of water form what is termed, in the papermaking sense, "hydration" and could well give rise to the various properties connected therewith. A diagrammatic conception of this may be seen in Figure 2 on a scale of magnification which greatly surpasses that of the electron microscope at present, as it shows not only micellae but cellulose molecules. It indicates the micellae being raised on the surface of a fibril (part of the primary wall having been mechanically removed prior to beating), and the subsequent collapse of the micellae upon drying and rewetting.

It seems probable that a reduction in the length of the glycosidic chains comprising the molecules of cellulose and allied materials by hydrolysis or oxidation (which, in turn, would also be reflected in a weakened micellar structure) would result in a larger number of chains being partially, or even wholly, detached from the surface. The partial detachment would result in a "surface suspension" or "surface colloidal solution" which would have a greater concentration than if the surface comprised longer chain material and, therefore, the surface with the shorter chain material would be able to effect a firmer bond with an adjacent cellulosic surface. In many cases, however, notwithstanding this increased adhesiveness, the maximum realizable strength of the resulting sheet with beating would be decreased by strong hydrolysis or degradation, because of the concurrent weakening of the body of the fibers and fibrillae.

Stamm and Hansen (*17*) and De Bruyne (*18*) have discussed the nature of adhesion and the type of bonding concerned with glued wood joints. It

Fig. 7—Fine fibrillae from beaten spruce.

is suggested that, when wood is thoroughly dried by the removal of a molecule of water from two adjacent hydroxyl groups, chemically inert ether linkages (C-O-C) are formed between adjacent chains which would completely resist the action of water. A similar effect may be obtained in part by momentarily heating paper made from chemical wood pulp to a high temperature; further, the action of excessive heat on moist mechanical pulp, which causes it to become completely water resistant, is only too well known.

The Properties of the Cambial Layer of Fibers

Turning to a consideration of the primary or cambial wall, which is present on all fibers, the outside layer is the first to be laid down by the plant and forms a continuous membrane, whereas the inner cellulosic anastomatic layers are successively formed daily, as illustrated in the beautiful cross-sectional photograph of a cotton fiber by Balls (*19*). The daily growth of rings of the fiber are very like the annual rings in the cross section of a tree; however, in the fiber they are formed from the outside in and, also, especially in the outer layers of wood fibers, the fibrous structure is oriented circumferentially; on the other hand, as the inner layers are formed in the fiber, their structure is oriented more and more axially. The primary or cambial layer (or sheath) corresponds in this analogy to the bark

of a tree. Bixler (*20*) has recently given a good description of these different layers and their properties, together with some interesting illustrations. The constitution of the primary wall has not yet been established. It is probably different chemically in wood and cotton fibers; the latter contain wax and pectin; the former contains

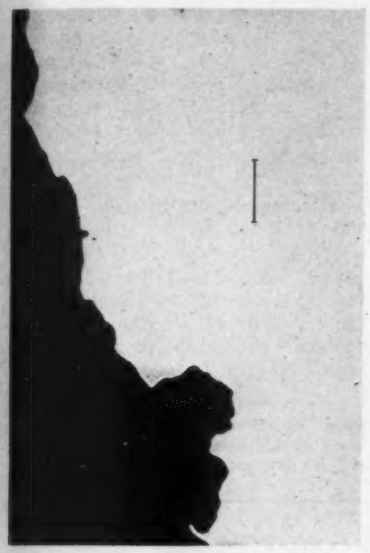


Fig. 8—Cross section of viscose artificial fiber.

no wax, and pectin, if present, is in very small amounts.

Lewis and Brauns (*21*) have shown that the primary wall material is insoluble in cuprammonium solution and that, although it is a carbohydrate, it is not cellulose. The writer has also incubated this material with a culture of *Cellulomonas liquata* for several weeks without its being sensibly attacked. Physically, this wall or membrane is very different from the inner layers because it is nonswelling with the usual cellulose solvents (e.g., cuprammonium hydroxide) and, while porous to water as are the other layers, appears to be a continuous membrane.

We conclude that, because this layer is relatively insoluble in such solvents, it must be to a similar degree relatively more insoluble in water than is cellulose. Accordingly, if a "surface" or partial solution is postulated as being necessary for fiber-to-fiber bonding of paper, then the presence of this skin is a positive deterrent. There does exist, however, the possibility that the inner surface of the primary sheath adjacent to the outer secondary wall may be somewhat similar in character to it, so that a surface colloidal solution might possibly form on the inner surface of any skin removed from the fiber by beating and thus allow one side of it to take part in bonding. As further confirmation of the nonadhesiveness of the outer surface of the sheath, it will be remembered that Doughty (*22*) was unable to obtain as much strength in a sheet having a high density by wet pressing only, as he could obtain by high pressure after a limited amount of beating. There seems little doubt now that the presence of much of the primary wall material on the surface of the unbeaten fibers prevented their maximum adhesion with pressing and this was not secured until the sheath had first been removed fairly completely by a small amount of beating.

Clayton Beadle (*23*) evidently suspected the presence and nature of this primary sheath, for he says:

"The rapid churning and agitation occasioned by the (beater) fly-bars, although wasteful, has a useful function, as it brings about a change in the stuff which beating alone would not accomplish. No doubt some change or changes take place in the stuff during the process of beating which cannot be described as beating, bruising, or cutting, namely, a sort of wearing away of the outer surface of the fibers as in the case of cottons. As an instance, virgin cotton, such as cotton lint that has never been submitted to the chemical and mechanical processes preparatory to wearing, even after boiling and bleaching, behaves like so much slag wool, and is almost devoid of felting properties; in fact, even after thorough beating it would hardly be recognized as cotton pulp, as we know the material when prepared from rags. By suitable beating, however, this material can be made to take on the ordinary qualities of cotton pulp. This change may be described as a wearing away or breaking up of the more resistant surface of the fibers, which cannot be accomplished so long as the fibers remain intact and covered with a resistant coating."

The outer part of the secondary wall near the primary wall of the spruce pulp fiber—that is, the layers which are first formed—contain more lignin, according to Bixler, and probably are composed of cellulose and allied material having a shorter molecular chain length than the inner layers, because they were formed while the fiber was in its immature stage of development; another possible reason for this is the fact that the outer layers are more exposed to the cooking liquors during isolation, so that the cellulosic material would tend to be more hydrolyzed or oxidized than in the inner layers, although Jayme and Grögaard (*24*) claim that lignin surrounding the micelles in the exterior layer would exercise a protective influence during cooking.

Assuming that the shorter the chain length, the greater the intensity or concentration of partially dissolved material in a surface solution, we should expect to obtain an enhanced degree of bonding from this outer layer when the cambial wall is removed, provided the short-chain material has not been removed by excessive cooking or, especially, by a caustic treatment. This would explain why a purified pulp high in alpha-cellulose content will not bond well, even after being opened out by beating. On the other hand, we have the holocellulose of Ritter (containing the entire carbohydrate fraction) which binds together well and also beats very readily (*25*), as does almost any pulp that has been isolated with a very high yield by a chemical treatment only.

During an experiment some time ago, bleached western hemlock pulp was disintegrated for 300,000 revolutions at 3 per cent consistency and a portion of the pulp was silvered for 12 minutes. On examination under the microscope, abundant evidence of the presence of the primary walls became manifest. Two of these fibers are shown in Figure 3. Evidently the treatment, which was purely one of rubbing, had progressed just far enough so that the primary walls were in the process of being finally rubbed

Fig. 9—Glass bead treatment of viscose artificial fiber.

off. Along the surface of almost every other fiber, a little shroud of wrapping was visibly thrown into sharp contrast with the body of the fibers by the silvering procedure. Having very much less reducing power apparently than the body of the fiber, they were colored a golden yellow by a very thin film of silver, in contrast with the jet

black of the fiber itself when illuminated by transmitted light. Had the silvering been carried to the normal extent for determining the specific surface, the cambial layer also would have become opaque and the contrast thus lost. It is very difficult to see the sheath without the silvering and, in consequence, it appears to have escaped the attention of those interested in the effects of beating. Lewis and others have shown that, as beating proceeds, the ballooning effect on the fibers of cuprammonium solution becomes less and less, which indicates a progressive removal of the membrane.

In Figure 3, the presence will be noticed of the characteristic bordered pits in the very thin outer skin that is being shed. Where this membrane is folded over, no fine fibrillae can be seen sticking out of the surface, nor are any visible on that part of the fiber where the skin is not removed. On the other hand, wherever this skin has been removed (which appears to be complete on the other fiber) the fibrillae are plainly visible.

A year after the photomicrograph in Figure 3 was taken, several electron micrographs of objects of interest in this paper were taken through the courtesy of Dr. G. R. Sears and Miss Evelyn Kregel of The Institute of Paper Chemistry. Six of these are shown in Figures 4 to 9. The scale mark shows a distance of 1μ and objects one-tenth of this size could not possibly be resolved with even the finest ordinary microscope and technique.

Figure 4 is a tangential view of the edge of a beaten spruce fiber, showing it to be positively devoid of fibrillae. The toothlike projection has also been observed occasionally on other fibers and may be the edge of a bordered pit.

Figure 5 is a tangential view of the edge of a beaten spruce fiber, which may be compared with Figure 3, but is of a very much higher magnification; the focus is not very good; the material in the light background is probably fibrillae.

Figure 6 is a view of some of the same sheath material shown in Figure 3, which has been lightly silvered; its membrane-like character is evident. The broad, dark streaks are probably fibrillae.

Figure 7 is a view of some very fine fibrillae from beaten spruce; some of the finest visible are only about 2 millimicrons in thickness.

Figure 8 shows the edge of a cross section of a sample of viscose artificial fiber and Figure 9 shows some of the fine material that was obtained by shaking some of these artificial fibers in water with glass beads. There are no signs whatever of fibrillation, in contradistinction to all fibers which are capable of bonding together to give paper.

It should be remembered that all these photographs are of materials which were mounted wet, then thoroughly dried, and placed in a high vacuum where they were heated by the bombardment of electrons; this undoubtedly affected their normal appearance.

EDITOR'S NOTE: This article is in two parts. Part II will be published in the next issue of this magazine. The bibliography will be published with Part II.

TEN COMMANDMENTS OF MOTOR MAINTENANCE*

▶▶▶ ELECTRIC MOTORS are the muscles of industry and if they are regularly serviced they will give dependable, long-time service. But neglect leads to breakdowns—with consequent interruptions in production—and, perhaps, to fire.

The following ten commandments of motor maintenance should always be observed, but, at the same time, shops where motors are used should always be protected with suitable types of approved fire extinguishers. Vaporizing liquid and carbon dioxide are suitable for this purpose since their contents are non-conducting and will not cause corrosion or otherwise damage motors.

1) Open-type motors should be blown out weekly; those operating under severe conditions, daily. Use no more than fifty pounds of pressure to avoid possible damage to insulation.

2) Follow manufacturer's instructions in lubricating motors. Too much oil is as bad as too little, causing deterioration of insulation.

3) Inspect bearings weekly or oftener. Feel temperatures, examine for excessive end play, and make certain oil rings are working.

4) Inspect brushes and commutators weekly or oftener. Make certain brushes are seated perfectly and commutators are smooth. Use proper grade of carbon brushes to prevent wear of commutator and reduce sparking.

5) Where motors operate with excessive belt tension, check the air gap between rotor and stator every week. A monthly check of motors in average use is sufficient. Difference in the width of the gap around the circumference of the rotor will indicate extent of wear on bearings.

6) Where motor leads are exposed to view, check them weekly to see that connections are tight, well insulated and protected, and free from oil.

7) Inspect ground connections weekly, keeping them tight and in good condition. This is for the protection of employees, and for the proper operation of over-current protective devices.

8) Set up a regular schedule for overhauling motors. Most motors should be overhauled annually, while those in severe use should be overhauled twice a year or oftener.

9) Dismantle the motor for a complete overhaul job. Wash all parts with carbon tetrachloride or some other safety solvent. Paint the windings with a good, oil-resisting insulating varnish.

10) Keep the area around the motor as clean as the motor. Arcing frequently ignites oily material that has not been cleaned up.

When fire breaks out in or around a motor, shut off the power before attacking the flames, if possible. Do not depend upon the circuit breaker operating or a fuse blowing out, but shut off the power. This will minimize damage to the motor and prevent continued arcing from re-igniting the fire. When the motor or conductors are dead, direct the fire extinguishing agent into the motor or upon whatever is burning, just as in any other fire. As soon as the fire is out, ventilate the area thoroughly to clear out smoke and fire gases.

*Released by the Safety Research Institute.

Paper Mill Maintenance Benefited by Arc Welding

RAY EDMAN, Machine Shop Superintendent
Northwest Paper Company

MATERIAL SHORTAGES and the fact that some machine replacements are impossible to obtain, has given added impetus to the use of electric arc welding for repairing and fabricating tools and machinery in paper and pulp mills throughout the country.

Work now being done by our company emphasizes the great economies and eliminations of equipment outage time available through use of the electric arc as a modern maintenance tool.

The maintenance of rolls in a paper mill, for example, is one of the many common problems due to the conditions under which mill equipment operates. Corrosion is the major factor in mill operations. The usage of stainless steels has materially reduced deterioration of this nature.

Some of the commonly known rolls used on pulp and paper machines are squeeze, press, breast, wire-carrying and felt-carrying. The finished roll shown in lathe (Figure 1) is a top squeeze roll and the one in the foreground under construction is a bottom squeeze roll. These rolls are usually made up of mild steel pipe and have a life of approximately two years. Keeping from 50 to 200 of these rolls in condition is in itself a sizable task.

Previously, stainless steel sleeves were shrunk on these rolls. As a result, this method of protecting rolls has been limited. Further, it is almost impossible for the mill to complete such an application. While this method was found effective, the costs were prohibitive. Furthermore, due to the various operations involved, it was impractical for the mill to carry out this method from an economic standpoint.

A new method was employed for the first time about one year ago when the first stainless-covered squeeze roll was completely built in our own shop and with little or no trouble. This roll has been in service for ten months without indication of failure in any respect. Several more have since been covered and now twenty additional rolls will be given this protection.

The finished roll shown in the lathe (Figure 1) is 7 feet long and has an outside diameter of 9½ inches. The one under construction is of the same length but is 7½ inches in diameter.

The actual covering of these rolls consists of the following: 16-gauge stainless steel sheet rolled to proper diameter allowing 1/32-inch opening for weld. This is slid onto the machined roll and clamped securely with the circle clamps shown in Figure 2. The first clamp is placed 2 inches from the end of the shaft and the other two clamps follow at 2-inch intervals. The free 2 inches is welded and the clamps are moved toward the center 2 inches further; then the welding operator completes 2 more inches of the seam. This procedure is used until the seam has been completed.

Three sheets have been used to cover the roll shown in Figures 1 and 2, due to restrictions in rolling capacity. There is, however, no reason why one single sheet cannot be used if rolls of sufficient length are available to roll this material. The welding was done with a 300-ampere welder*, and with 5/64-inch and 3/32-inch electrodes. Normal welding procedure was followed. It was discovered that welding not only provided a very simple method of obtaining the desired result, but also the contraction of the weld metal resulted in virtually a shrink fit. This was, of course, an advantage as there cannot be any gaps between the stainless sheet and the pipe itself. Arc welding is the only method that could be used to obtain these desired results.

After the welding has been completed, the entire assembly is placed in the lathe. It is first ground and then polished. The grinding is mainly to take down the weld bead. The precision with which this covering can be applied eliminates all need of machining or grinding aside from the weld area itself. The balance is readily polished.

The stainless sheet protrudes at the ends ½ inch, therefore, this is crimped or rolled over at the ends. This is added protection to the roll itself and eliminates any possibility of movement.

Cost to Cover One 7-Foot Roll—9½ Inches in Diameter

Material, approximately 21 square feet 16 gauge 18-8 stainless	$30.00
Welding rod—3 lbs.	4.00
Cutting and rolling 16 gauge stainless	5.00
Jigs and fixtures	10.00
Welding operator	4.00
Helper	4.00
Grinding, polishing, crimping ends in lathe	10.00
Experimental	10.00
Total	$77.00

This is only one example of how arc welding can be applied to save time, materials and costs in paper mill maintenance. There are many similar jobs where welding has proved to be of tremendous benefit.

(*) Welder and electrodes ("Stainweld A") supplied by The Lincoln Electric Company, Cleveland, Ohio.

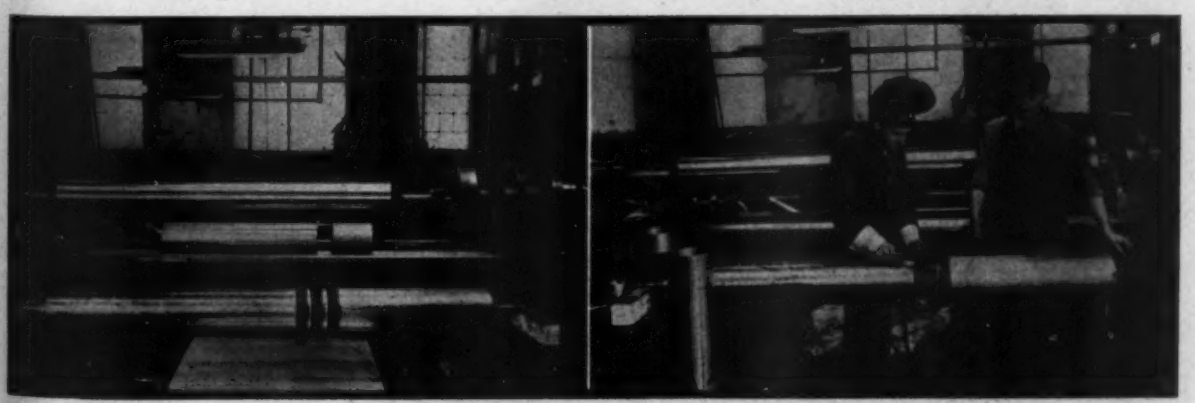


Fig. 1 (left)—Welded sleeve (foreground) with circle clamps in place. Weld seam is plainly visible at right. Finished roll is shown in lathe (background) where it is finished and polished. Fig. 2 (right)—Method of applying clamps used in welding stainless steel sleeves on rolls for wet machine.

PAPER SKETCHES

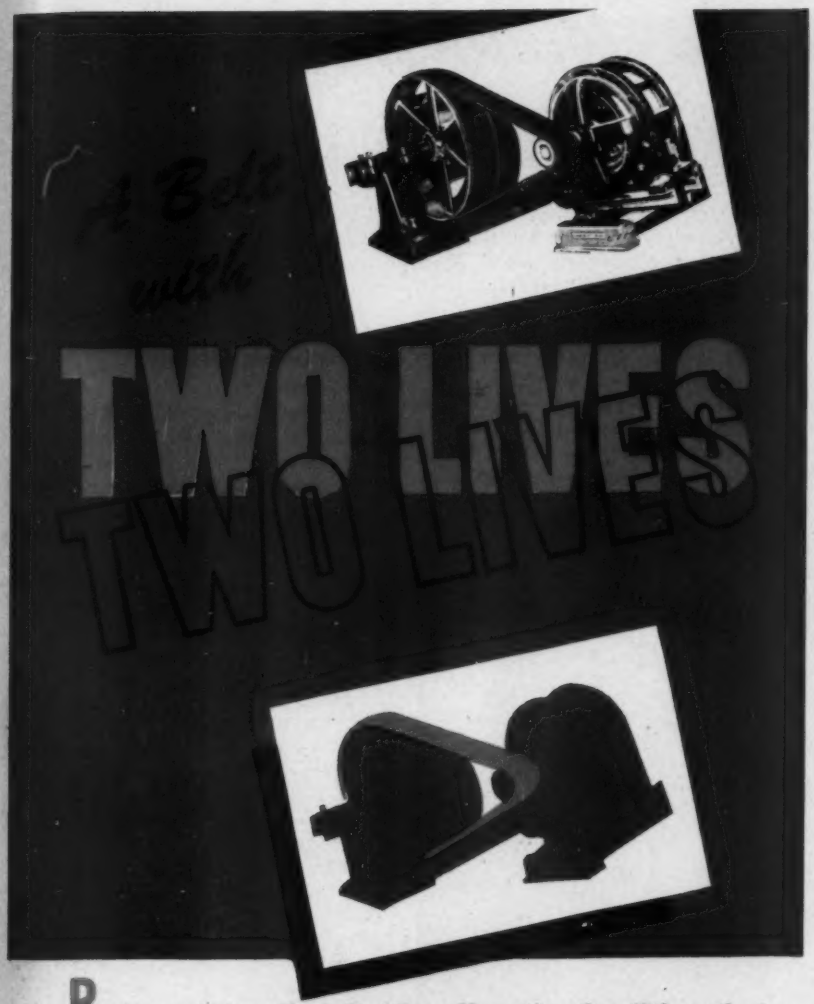
REVOLVABLE BARRELS OF PASTEBOARD UPON WHICH WERE WRITTEN TIBETAN PRAYERS WERE SET UP FOR DEVOTIONAL PURPOSES ALONG THE ROADS OF MEDIAEVAL TIBET. WHEN A PERSON WISHED TO PRAY, HE SIMPLY SET A BARREL TWIRLING.

IN 1859, CAST-OFF GARMENTS, PICKED OFF THE STREETS OF SAN FRANCISCO, WERE USED FOR PAPERMAKING BY A MILL IN MARIN COUNTY, CALIFORNIA!

IT IS ESTIMATED THAT ABOUT 40,000 TONS OF STEEL ARE BEING SAVED A YEAR THROUGH THE SUBSTITUTION OF PAPERBOARD CONTAINERS FOR TIN IN THE PACKAGING OF APPROXIMATELY 700 MILLION CANS OF TOBACCO. THIS CHANGE IN PRACTICE HAS BEEN BROUGHT ABOUT BY STRATEGIC DEMANDS OF WORLD WAR II.

Burkle

WHEN A FLOOD IN 1701 CARRIED AWAY THIS COUNTRY'S FIRST PAPER MILL, WILLIAM PENN ASKED THE NEIGHBORS OF WILLIAM RITTENHOUSE, ITS OWNER, TO HELP HIM BUILD A NEW MILL



Research Leather Belting Has the Qualities that Give Longer Life in Paper Mill Service

Waterproof. Moisture conditions do not affect Research because the leather is waterproof and the belt is put together with waterproof cement.

Built-in pulley grip. Research keeps machines up to speed by delivering maximum power *with less belt tension.*

Greater pliability. Research withstands constant flexing over small pulleys.

Natural overload capacity. Research is ideal for such drives as beaters and jordans.

Less stretch. Removal of initial stretch during manufacture, together with high tensile strength, means less lost time for take-ups.

RESULT: Research leather belting will serve you longer than any other belting (on a pivoted motor base drive, Research will have at least double the life of a rubber V-belt).

No wonder more pulleys are belted by Research than by any other brand!

Graton & Knight is the only leather belting manufacturer with complete nation-wide service facilities. Branches in Chicago, Cleveland, Dallas, Detroit, Kansas City, Minneapolis, New York, Philadelphia, St. Louis, San Francisco; distributors in all industrial centers.

GRATON & KNIGHT COMPANY

WORCESTER 4, MASS.

Look under "Graton & Knight" in Belting section of Classified Telephone Directory or THOMAS' REGISTER.

PERFECT *BALANCE* IN A LEATHER BELT

Modern mechanical methods replacing hand methods in the manufacture of leather belting are responsible for the increased machine production and longer belt life obtainable with Research Leather Belting.

Leather is naturally the ideal medium for power transmission — low cost, greater frictional pulley grip, greater overload capacity, ease of installation, longer life. By overcoming its one disadvantage — the natural variation in the thickness of the hide — Graton & Knight provides a leather belt with perfect balance.

Graton & Knight does this, by depending upon mechanical means, rather than hand methods, to select uniform thicknesses. The Graton & Knight Belt Thickness Machine stamps the exact thickness to an accuracy of .008" in 185 places in the average-sized belting bend. Guesswork is completely eliminated; the leather is cut, scientifically, into strips of uniform thickness, insuring perfect *balance* in the running of the belt.

GREATEST BELTING ADVANCE IN 50 YEARS

Again, in the cementing of laps and plies, a Graton & Knight patented development provides uniform cement coverage of every part of the cemented surfaces to be joined — more permanent adhesion.

Replacing hit-or-miss hand methods, the Graton & Knight Belt Cementing Machine applies the cement with perfect uniformity and does the pressing in one continuous operation — all while the belt is *under working tension.*

So Research Belting is cemented to stay, because the cement is uniformly distributed and the cement line is the same length as that of the belting. Furthermore, the cement is waterproof, extremely flexible and heat resistant.

Graton & Knight's *tension cementing* is the most important development of the last 50 years in manufacturing leather belting. It means that you can expect top performance and longer life with Research Leather Belting.

Wartime Service Meeting of Superintendents Association

▶▶▶ THE TWENTY-FOURTH annual convention of The American Pulp and Paper Mill Superintendents Association, Inc., was held on June 15, 16 and 17, 1943, at Hotel Commodore, New York City. Designated as a Wartime Service Meeting, the convention was characterized by two outstanding themes: Humanics and the Raw Materials and Products Situation.

Opening on the morning of the first day with a business meeting, with Grover Keeth, president of the Association, presiding, invocation was offered by the Rev. A. Hamilton Nesbitt, St. Luke's Methodist Episcopal Church, New York City.

In calling the meeting to order, President Keeth made reference to the gavel he used. He stated that both the gavel and base had been molded from a plastic produced by the Marathon Paper Mills Company, Rothschild, Wisconsin (the company with which he is associated) from the waste liquor of its sulphite pulp mill.

Following invocation, the following list of members who had passed on since the Grand Rapids (Michigan) meeting of last year was read: Nelson R. Davis (past president), John J. Braun, Daniel E. Dupius, U. Grant Farmer, Carl Jentz, John J. Lobb, John Nolan, August F. Richter, and Angus M. Wilson.

With the "In Memoriam" service completed, Mr. Keeth proceeded with the presentation of the President's Message.

Mr. Keeth related that he has been a member of the Association for 15 of the 24 years of its existence; and has served as an officer of the Associatiton for eight of those years.

A steady and healthy growth of the Association and harmony within the organization, added Mr. Keeth, shows that the founders of the Association built well.

Mr. Keeth recalled that soon after becoming president of the Association he found there was a great deal he did not know about it. Reference also was made by him to the foundation stone of the Association's emblem and to the word CONFIDENCE inscribed thereon. One definition of confidence, said Mr. Keeth, is the following: "State of mind characterized by reliance in one's self." To become self-reliant, Mr. Keeth suggested the acquisition of knowledge gained from attending meetings of the Superintendents Association. "Bring something to the meetings," he emphasized, "and I'll guarantee you will get it back with interest."

At this opening meeting Mr. Keeth appointed the following committees and asked for their respective reports at the business session scheduled for the afternoon of the second day: *Auditing*—Homer Latimer, Roy Zellers, Walter Johnson; *Resolutions*—Harry E. Weston, K. E. Terry, Ray L. Barton; *Nominating*—F. C. Boyce, Roy Kelly, William Brydges, Fred Rooney, S. R. Olsen.

S. G. BLANKINSHIP
Newly elected president of The American Pulp and Paper Mill Superintendents Association.

Before concluding the opening meeting, Mr. Keeth called attention to a communication from Robert Patterson of American Writing Paper Corporation. In this communication, Mr. Patterson suggested that future conventions of the Association should give greater consideration to the graphic arts.

HUMANICS HIGHLIGHTS TWO CONFERENCES

Two general conferences were held during the convention in which the subject of humanics was highlighted. The first of these conferences followed immediately after the conclusion of the first business meeting. At this conference Sterling W. Mudge, district director, Training Within Industry Service, War Manpower Commission, New York, N. Y., utilized three members of the audience, and put on an actual demonstration of "Training Within Industry."

"Training Within Industry"

In introducing his remarks, Mr. Mudge said that it had been his pleasure to attend a number of national conventions, and that generally he liked to know something about the speaker to whom he was expected to listen. He then proceeded to tell the audience about himself. He related that he was a mechanical engineer by training; that he served his time as an apprentice; that later he was a superintendent and then a production manager; that over a period of years he was also connected with the Socony-Vacuum Oil Company, first in the sales department, then as assistant general manager, and finally as director of training.

Previous to the actual demonstration of the wrong and right way of training procedure, Mr. Mudge said that the trend today is for more training on the part of foremen, supervisors, superintendents, and management generally, as well as for the ordinary workers; and that training must be desired—it cannot be forced on anyone.

The procedure followed by Mr. Mudge in making a training demonstration was straightforward and simple. The demonstration involved the tying of a fire underwriter's knot.

At the outset Mr. Mudge made such a knot from a short section of twisted, fabric-insulated, electric wire. The operation looked simple enough; but when the speaker presented verbal instructions to a member of the audience who volunteered to act as trainee, it was not possible for the trainee to complete the knot accurately.

Mr. Mudge made it clear that it was not the fault of the trainee in failing to make the knot correctly, but rather it was the fault of the instructor. Instructions had been too detailed for easy understanding.

A second volunteer also failed to make the knot even though Mr. Mudge simplified his procedure by slowly making the knot again, as he faced the trainee, and explained while doing so just what steps were made. In this case, however, the volunteer, be-

On top of . . . *tomorrow!*

Funny place for a man to make his office—especially if he doesn't happen to belong to an "open-air" cult.

But watching which way the wind blows is serious business these days, for war is constantly altering the direction which industry will take when peace returns. Shifts are sudden . . . and their effects are felt in unexpected places . . . influencing products, transforming plans.

From his panoramic vantage point the Wyandotte man is keenly attuned to the trend of events affecting users of chemicals. Alert to developments in the offing *now*, he is uniquely qualified to help you foresee the future's form.

In our technical laboratories, research continues on new applications of chemicals . . . new techniques to increase their efficiency and facilitate their handling. These war-born skills—teamed with a long-range *awareness* of what's doing in the world of industry—make Wyandotte a useful ally to call in.

• Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and The J. B. Ford Company to better serve the nation's war and post-war needs.

WYANDOTTE CHEMICALS CORPORATION
MICHIGAN ALKALI DIVISION • WYANDOTTE, MICH.

Wyandotte
OFFICES IN PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • CHLORINE • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • DRY ICE

cause of the demonstration, was able to get farther than in the previous case.

Mr. Mudge then proceeded to demonstrate the proper procedure for teaching a trainee how to make the knot. In doing so, he greeted the third volunteer as if he was a new employee. Then, he stood in such a way that the trainee would see the knot being tied just as he would observe it if he were tying it himself; and, in this position, he proceeded to tie the knot and to explain simultaneously just what he was doing.

Such a demonstration proved clear and understandable to the third volunteer. With the demonstration completed, he made the knot correctly on the first try, and, in doing so, explained each step in much the same way as explained to him by Mr. Mudge.

Mr. Mudge mentioned the availability of the Training Within Industry service to industrial plants, stating that the service is provided without charge. The course, he stated, consists of five 2-hour sessions and is designed to teach supervisors, foremen, or other key employees how to instruct.

"If the worker hasn't learned, the instructor hasn't taught," said Mr. Mudge in closing his remarks.

"Women in War Plants"

The second general conference, stressing the subject of humanics, was held throughout the afternoon of the second day. At this conference, a paper, entitled "Women in War Plants," was presented by Miss Ellen M. Davies, personnel director, Chase Brass & Copper Company, Waterbury, Connecticut.

Miss Davies called attention to the large numbers of women that have been and are being inducted into war plants and said that this induction presents many new problems to the emp'oyer. The problems, in her opinion, can be met through preparation for and the recruitment, training and retention of women workers. Miss Davies stressed the fact that unless these four phases in the program for the utilization of womanpower are properly organized and developed by the employer, his program is very apt to bog down somewhere along the line.

Miss Davies also related that there is a very definite trend toward the development of courses in engineering and administrative work for women by some of the liberal arts colleges and technical schools. Rutgers University, Stevens Institute, Mount Holyoke, Syracuse University, the state colleges and other schools, she stated, are offering courses to women in preparation for positions in technical departments, laboratories, personnel and engineering departments.

Summarizing her paper, Miss Davies commented as follows:

1) A careful job inventory will disclose jobs where replacement of men will be required because of the acute need to enlarge the Armed Forces.

2) Careful and accurate job analysis and job specification will disclose jobs where women can and must be used.

3) Women workers must be selected carefully with regard to their physical, mental and emotional capacities.

4) Absenteeism will result if women have a transportation problem which has not been arranged for.

5) Unions, supervisors and male workers must be sold on the idea of women workers before they are inducted into war jobs.

6) Training programs must be worked out to meet the emergency needs and women workers must be trained early enough so that there is a minimum loss of production.

7) Women should be paid at the same rate as men for equal production and skill.

8) Plant facilities and working conditions must be such as to attract and hold desirable women workers and should be arranged for before women are employed.

9) Finally, the hours of work must be so arranged that women will be able to carry on in war jobs for years if need be, and that everything necessary must be done to sustain the morale which is so essential if we are to conclude our war effort in *Victory*.

PRESENT MATERIALS SITUATION

The present situation regarding raw materials and supplies was elucidated by E. W. Tinker, executive secretary, American Paper and Pulp Association, and by James L. Ritchie, chief, Materials Department, Pulp and Paper Section, War Production Board. Mr. Tinker's subject was "Raw Materials as Related to the Supply of Essential Paper and Paper Products." Mr. Ritchie spoke on "Materials."

Raw Materials and "Essentiality"

Mr. Tinker related that paper has been a cheap and expendable commodity; and that its very plentifulness and cheapness have led to misconceptions that bid fair to create another national scarcity and resultant national injury.

The general conception that paper in the main and in vast quantities, added Mr. Tinker, is not absolutely necessary to the war program has influenced decisions and actions in Washington without regard to industry advice and recommendations with the result that unless immediate remedial steps are taken, grave difficulties will be created.

Mr. Tinker, in continuing his remarks, said, "Fundamentally, the industry's position will be determined by the availability of an adequate and suitable fiber supply. The availability of this fiber supply is contingent upon action to assure, without question, the production of an adequate supply of pulpwood. If definite or positive action is not taken to provide for this and the required manpower made available then beyond question the country is faced with injurious shortages that will be extremely difficult if not impossible to overcome. Perhaps it is only by such unfortunate and painful circumstances that the essentiality of paper can at long last be brought home to the responsible authorities."

Mr. Tinker further commented that it is unnecessary to outline the situation with regard to pulp supplies and the declining inventories; that the action of the Pulp Allocation Committee of the War Production Board, bears witness to the fact that the situation is extremely acute and growing precipitately worse; that the industry has and does face many difficulties but they can be overcome with the one exception of our shortage of pulpwood. "There is adequate timber but if manpower is not provided to make the wood available, a situation with national implications will inevitably arise," said Mr. Tinker.

It was also brought out by Mr. Tinker that the Department of Agriculture has co-operated in the use of its vast organization of county agents to encourage the production of more farmer wood; that Donald Nelson has issued a public statement that the production of more pulpwood was of great interest to the War Production Board and in the interest of winning the War; that publishers have developed material that is being distributed through the four and a half million circulation of farm journals and magazines, emphasizing the necessity for the production of more pulpwood; that a national committee has been organized within the industry to sponsor a broad and aggressive campaign of publicity; and that the use of prisoners of war, internees and conscientious objectors, as woods labor, offers possibilities and efforts are being made to develop plans along these lines.

As a definite part of the picture with relation to fiber supply, Mr. Tinker stated that the use of secondary fiber on the part of the industry is called for. To the paper mill superintendents and technicians available to the industry, he commented, a chal-

Wasps and hornets were the first paper makers. They chewed vegetable fibers into a pulp and smeared the pulp into small flakes. The sun did the drying.

GOOD The Egyptians improved upon this method by pressing together fibrous shreds of the papyrus, moistened with water which the dry air of Africa evaporated.

BETTER

The Chinese and later the Europeans made excellent paper with hand deckles, pressed it between sheets of felt and hung it in lofts to dry.

BEST

The most successful paper makers of today use Hamilton Felts both for forming and for drying their product. Whether they are manufacturing papers for printers, engravers, typists, writers or for the innumerable uses of commerce and industry, they rely upon the uniformity of Hamilton Felts to produce equal uniformity in the formation and finish of their sheets.

Hamilton Felts remove more water and consequently deliver dryer sheets to the rolls. They do their work fast and with minimum broke. They increase the strength of the paper and leave no irregularities in its finish.

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lenge is presented—a challenge requiring the abandonment of traditional furnishes and the use of every conceivable process, and all of the ingenuity and technical skill available to produce that which the country requires.

In concluding his remarks, Mr. Tinker said that 20,000 workers made available in the five major forest regions of the United States would solve our insurmountable problem; and, if this medium of manpower is not immediately available, a shortage crisis is inevitable and a vast industrial structure will be partially paralyzed for the duration.

Metal Requirements

Mr. Ritchie, in his paper on Materials, made several interesting comparisons of the metal requirements of the pulp and paper industry with those of the war program. He said that every time a new battleship slides down the ways, the copper equivalent of an eight months' supply of paper machine cloth goes to sea; that in two hours' firing time, that battleship will throw 14 miles a volume of steel equivalent in weight to a full calendar quarter's supply of maintenance and repair parts for pulp and paper machinery; and that in one hour's time, a flight of 1,000 bombers can drop a volume of steel equivalent in weight to a six months' supply of maintenance and repair parts for pulp and paper machinery.

In making these comparisons, Mr. Ritchie explained that every effort has been made to reduce the pulp and paper industry's consumption of critical materials to a reasonable practicable minimum.

Further highlighting Mr. Ritchie's remarks:

"Material shortages are not the only factor to be reckoned with in planning maintenance and repair programs. Deliveries of maintenance and repair materials are delayed fully as frequently because of the fact that the facilities of producers are fully occupied with war work. Shop time, in the case of many items, is far more critical than the materials from which they are made.

"In planning maintenance and repair programs, mills, for their own protection, should be fully cognizant of this facilities problem. To the extent that delays can be forecast, they should not seriously interfere with maintenance programs.

"It is the intent of your suppliers, as well as of the War Production Board, to reserve adequate productive facilities in the shops of the pulp and paper machinery manufacturers to assure continued maintenance for this industry. Up to the limits of this reserve, it is our hope that the war output of your affiliates will continue to expand. The diversion of either materials or shop time from war production at this juncture is no more defensible today than it would have been a year ago.

There were many smiles and cheerful greetings at the meeting, a large share of which was occasioned by the good feeling shared by all to see Robert L. Eminger, secretary-treasurer of the Association, going about as usual and looking so fit. "Bob" had a little vacation from his duties for a while, but he is fine again. L to R: J. C. Schmidt, E. I. du Pont de Nemours & Co., Inc.; Mr. Eminger; L. W. Elliott and Joseph Stuart, both of Lobdell Company; R. R. Stoltz, Westinghouse Electric & Mfg. Co.

"Shortages of woods labor have accentuated demands for labor saving woods equipment. At the same time the supply of such equipment in most instances has either been curtailed because of material shortages, or is being absorbed by direct military demands.

"Manpower shortages have increased the demands for power saws, particularly in the Southern area. There are relatively few producers of this type of equipment and patent rights have been closely held. There is some prospect that productive capacity may be increased through licensing agreements; negotiations toward this end are now pending.

"A priority system has been established for the Eastern gasoline-shortage area to assure the continuance of essential automotive transportation.

"Pulpwood, woodpulp and waste paper are included in the list of essential industries to be accorded preferential treatment in the Eastern gasoline-shortage area.

"Allotments of metal for the production of paper machine wire cloth have so far been adequate to insure continued paper machine operation. The wire cloth manufacturers have been most co-operative in supplying basic data for use in the negotiation of allotments.

"Requirements of such items as wire cloth, and indeed of other expendable items such as screen plates, beater bars and jordan fillings, can be forecast by paper mills with a reasonable degree of mathematical accuracy. If forward orders are placed on the basis of such forecasts, the production problems of the manufacturers and the allocation problems of the War Production Board would be simplified. Advance scheduling of wire cloth orders is entirely consistent with WPB Limitation Order L-209 and with the maintenance of minimum practicable working inventories — orders should be periodically re-scheduled, if necessary, to adjust for inventory depletion.

"Possible bottlenecks in the transportation of oil threaten the production of companies that are dependent upon fuel oil for their operation.

"Current information indicates that the fuel oil shortage during the coming winter will be as bad, if not worse,

REFILLING IS AN IMPORTANT PART OF OUR SUPER-CALENDER ROLL BUSINESS

REFILLING and refinishing of super-calender rolls has always been an important part of our roll business. Now it is more important because new rolls are hard to get. We can supply you with Appleton Fillings for your rolls to fit your finishing requirements. Our selection covers the full range from cotton through to the hardest paper rolls. It includes our New Process Fillings especially developed for coated and clay filled stocks run at high speeds. For the finest finishing results on all papers this wide selection provides the exact type for any super-calender or embossing application. In spite of wartime restrictions we maintain our high standards of quality. Our experienced mechanics are on the job. For better finish, be exacting in specifying your fillings. Have them fit the individual requirements of the papers. For longer service life, take extra care in the handling, breaking-in and operating of your filled rolls. We refill rolls of any manufacture.

than the one that was faced during the early months of 1943.

"The Pulp and Paper Division for over a year has urged conversion from fuel oil to coal in the critical Eastern area. Many pulp and paper mills have responded and are now in a position to continue operations regardless of oil curtailments. Conversion at this time will have a two-fold effect: (1) It will protect a company's operation, and (2) it will release fuel oil for war uses.

"Total output of bituminous coal during 1943 is forecast at approximately 600,000,000 tons.

"The Department of the Interior has indicated . . . that mines in the United States must be kept in full operation continuously throughout every month of 1943 in order to provide coal to meet present estimates of the country's war expanded requirements. . . . Rationing of coal, however, is not expected unless strikes or severe loss of labor interfere with production and delivery.

"Conversion from oil to coal, on the one hand, and stockpiling of coal while stockpiling is possible, on the other hand, would seem to afford the best insurance against heat and power problems in this industry during the coming winter.

"Fortunately, most of the bulk chemicals consumed in the industry have up-to-date been relatively free; there have been no serious procurement problems with respect to such items as soda ash, caustic soda, sulphur, lime, rosin, salt cake, alum, and clay. Nor is it expected that there will be serious war competition for supplies of these materials. If problems do develop, they will probably be caused by manpower or transportation shortages.

"There are two factors that might tend to increase the supply of casein: (1) an improved price level, (2) increased imports.

"The price of casein is currently fixed at a level that will prevent the operations of the casein producers from interfering with the projected dried milk program. It is indicated that any price adjustment that can be negotiated will take full cognizance of the requirements of an expanded food program.

"The amount of shipping space that can be made available during 1943 for casein imports cannot at this time be accurately estimated. The possibility of increased imports of Argentine casein affords the chief hope for an improved casein supply.

"The following factors will influence the supply of starch, starch products and derivatives available for use in the paper industry.

E. W. Tinker, executive secretary of the APPA, spoke on the subject "Raw Materials as Related to the Supply of Essential Paper and Paper Products."

"1) Flood conditions throughout the corn belt will have serious impacts on the overall corn supply.

"2) Competing claims upon the corn supply will increase as a result of demands for increased food production. . . .

"3) The competing claims of new industrial users are increasing requirements. The alcohol program is a case in point.

"4) Imports of tapioca and potato starch, which formerly amounted to 25 to 30 per cent of the total starch supply have, for the most part, been cut off. This will result in additional drains upon corn starch.

"5) The casein shortage will result in further drains upon available supplies of corn starch.

"As the full impact of these factors is felt, Limitation Orders restricting consumption of starch in the paper industry will probably have to be written.

"Shortages are apparent in the supply of glycerine, certain types of wax and other protective coating materials.

"Glycerine, amorphous and microcrystalline wax, and other important chemicals used for protective coatings are under complete allocation. Because of increasing demands for war uses the supply will continue to be tight.

"A very limited amount of metal is allotted to the Pulp and Paper Division for construction and facilities. Under present conditions, it has seemed wise to expend these materials in a manner that will expedite and improve woods operations and sustain pulp production since this is where our major problem lies, rather than to expend them for the improvement of paper productive facilities. This is the current policy of the Division."

Paper Industry Trends

Robert J. Zaumeyer, chief, War Products Development Section, Pulp and Paper Division, War Production Board, covered the present situation in regard to product trends. His subject was "New Developments and Trends in the Paper Industry."

In part, Mr. Zaumeyer made the following comments:

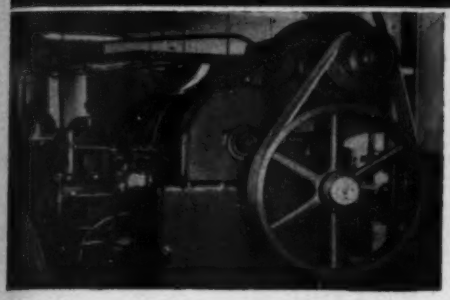
"The War Products Development Section of the Pulp and Paper Division of the War Production Board has had as its objective the encouragement and expediting of the development of paper and paperboard for war uses.

"Wet strength technics have been applied to many war uses for paper. Map and chart paper has gone modern in this respect. . . . The new map papers can be used in the rain or immersed for long periods in sea water without failure. They can be washed free of mud, grease, and blood without fear of disintegration.

"Camouflage paper must also exhibit these properties in addition to good dry strength and flexibility. Many Army and Navy manuals that are used in all kinds of weather are being printed on high wet strength papers for obvious reasons. Light weight tissue papers developed for specific functional end uses have been remarkably improved.

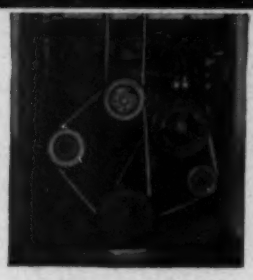
"In the packaging field, this dis-

In Use for Years by Leaders of U. S. Industry



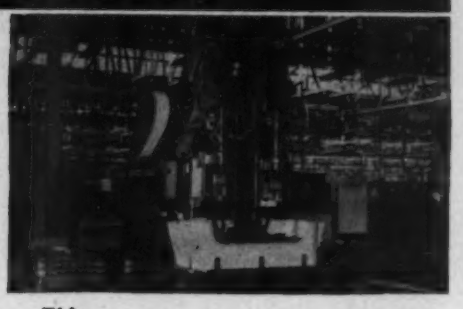
In a Leading Machine-Parts Plant—

belts on screw machines and grinders are subjected to a severe oil condition. GATES special synthetic belts were adopted 100% for this severe service after months of testing proved that they last three times as long as any rubber belt ever used.



A Large User of Rear Engine Coaches

could get only 13,000 to 14,000 miles from natural rubber belts in rear engine coach and bus service where rapid and frequent acceleration and deceleration create high temperatures. GATES special synthetic belts are giving double the life in this demanding service.



This Outstanding Aircraft Factory

—one of the nation's leaders—has found that Gates special synthetic belts last three to four times as long as regular rubber belts on machines where the belts are badly exposed to oil.

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Are Giving Up to 230% Longer Life than natural rubber belts when subjected to heat and oil . . . Initial cost at present is higher . . . recommended to meet especially severe oil and heat conditions.

Gates has been building V-belts with synthetic rubber for many years. Thousands upon thousands of Gates V-belts without an ounce of natural rubber in them have now seen years of service in many of the nation's leading industrial plants.

From this long experience with synthetic rubbers, Gates engineers have developed a V-belt built of a special synthetic which withstands severe heat and oil conditions that natural rubber simply cannot stand. The initial cost of these special belts is at present higher than Gates Standard Vulco Ropes. That is why the Gates Field Engineer you consult now recommends this special heat and oil belt only if its higher cost will be more than offset by longer service life.

There are many commercial types of synthetic rubbers. Gates has had wide experience in the use of all of them.

You have doubtless seen recent press dispatches stating that all V-belts will shortly be made of synthetic rubber. Gates long experience and success in this field clearly represent a substantial advantage in giving you a synthetic rubber V-belt of truly superior quality.

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In the center of this group are a past president of the Association and one of the headline speakers on the program. L to R: Wm. R. Zwecher, Seaman Paper Corp.; Oscar Stamets, Riegel Paper Corp., and a past president of the Association; S. W. Mudge, district director, Training Within Industry Service, War Manpower Commission (New York), who spoke at the general conference following the opening session; and T. E. Dial and W. H. Whitney, both of Socony-Vacuum Oil Co., Inc.

covery will further improve the multi-wall paper bag and enlarge its already wide scope. The multi-wall bag industry has done an outstanding job in substituting for critical burlap and metal containers for the shipping of many commodities.

"In the realm of twisting papers, one can picture new frontiers with higher dry and wet strengths. Our section in WPB is actively expediting a substitution project for binder twine.

"The Carpet and Rag Institute in normal years, uses 80,000,000 lb. of jute. Paper yarns have been found to be more desirable for Axminster rugs than jute. With good wet strength and pliability to resist the shampooing process which rugs undergo in service, we open up a new postwar market of tremendous possibilities.

"The familiar V-box is thoroughly representative of the technological advance that can be made under war pressure. . . . The motivating force in the development of this container was the result of the failure of existing containers. . . . After extensive experimentation and field testing, the industry met the challenge and we now have an overseas shipping container having a dry pop test of over 750 lb. and a wet pop of over 500 lb. after submersion for more than 25 hr. The container also has the ability to withstand exceedingly rough handling after submersion.

"A variation of the V-box will be used in peacetime to overcome difficult refrigeration conditions at high relative humidity followed by rough handling and shipping conditions.

"There has been quite an extension in the field of impervious paper for food and ordnance wrapping during this war. . . . Best results have been obtained with laminated materials utilizing the best functional properties of each material. The components used are strong kraft, cellophane, glassine, metal foil and elastic plastic films with asphaltic compounds, waxes, thermoplastic resins and asphalt resin combinations utilizing the most modern techniques of impregnating, coating and laminating. These developments have led to positive protection against moisture vapor penetrability, light, foreign odors and insect infestation. The qualities of greaseproofness, flexibility and waterproofness have also been attained. Papers are applied in the form of bags, envelopes, casing box liners, canisters, bag in carton, and bag outside carton.

"The paper industry is very closely related to the new plastics industry and that is fortunate because the growth of the latter industry has been phenomenal and, to a large extent, has shown surprising independence of the national economic situation.

"Some plastics can be thought of as by-products of the wood pulp industry. By chemical processing of certain pulps we obtain cellulose nitrate, which makes good gunpowder, and our oldest plastic, celluloid.

"Cellulose acetate is also widely used as an alternative for glass, and in the rayon industry it represents a fast-growing synthetic textile. Other chemical compounds of cellulose produce cellophane and viscose rayon.

"Additional derived products of cellulose are methyl, ethyl, and benzyn cellulose.

"Even lowly lignin is receiving considerable attention and some application as a plastic material in this war.

"One large producer of plastic molding compounds is marketing a general purpose phenolic material employing waste sulphite lignin as an extender for the very critical phenolics. Lignin enriched pulp, replacing wood flour, as a filler for plastic molding compounds is also coming to the fore.

"In the structural field, the new high strength paper base laminates excite the imagination as a functional material. The new low pressure synthetic resins have accelerated this development. Research and development programs are continuing in our industry. The work of the companies and of the Forest Products Laboratory has demonstrated that paper-base sheets from kraft and cotton fibers are as suitable as Mitscherlich sulphite pulp for use in high strength paper laminates.

"The preformed and molded pulp products have been brought into sharp focus by wartime developments. Instrument and clock cases, flare spacers, walky-talkie battery and flash light cases, helmets of various types, special cups, hand grenades, special shell cases and canisters are some examples. The use of resins, some noncritical, have helped to meet the specifications for these applications.

"It is of considerable interest to note that a large automobile manufacturer has recently taken out a patent for an automobile body made by the pulp preforming process.

"One of the most significant trends that the war has accentuated, is the combining of paper and paperboard with other materials such as steel and plywood, when those materials serve as cores or reinforcing components.

"Fiber drums have also reached a prominent position as a result of new manufacturing methods. They have replaced steel and will continue to do so in the future.

"The war has seen a very definite trend toward lighter basic weight papers. Many of those papers will not revert during the peace. That is especially true in fine writing papers. Better opacities are now obtainable through the use of improved pigments and better strengths are to be had by improved pulps and treatment of

Fig. 500—Bronze Gate Valve for 125 pounds W. P. Has screwed ends, screwed-in bonnet and taper-wedge solid or double disc.

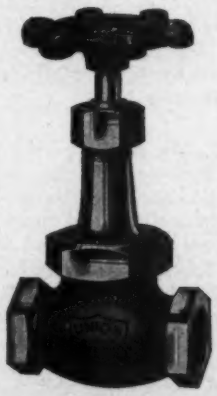

Fig. 150—Bronze "Union Disc" Globe Valve for 150 pounds W. P. Screwed ends, union bonnet, and renewable vulcanized composition disc—especially adapted for throttling service—for the control of low-pressure steam, oil, water, gas, etc.

Beginning of a long life in the POWELL Line

Before a Powell Valve earns the right to bear this time-honored name, it is called upon to prove its acceptability into an illustrious family. In blunt words, it must fill a need—actual or anticipated—before it is permitted the responsibilities of the family name.

From the moment of its conception by Powell engineers and consultants, that valve is engineered to its purpose. It must meet every requirement of "Standard of Control", which is the family motto.

This goes for *all* Powell Valves . . . of every type . . . of every proved-in-service material . . . for every need. Powell takes this special care because its near-century-old name rests upon the *pre-determined performance of every Powell Valve.*

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Dependable Valves Since 1846

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POWELL VALVES

pulps. Concurrent with the lighter basis weight, there will naturally follow a demand for higher paper machine speed.

"Paper is even being used in the manufacture of printing plates. . . . This development has conserved significant quantities of zinc and aluminum but it must also be said that its technical advantages predict a significant peacetime application.

"There is some development in the application of some natural fibers due to shortages created by the war. Yucca from Arizona, New Mexico and Mexico, is being employed as substitute for manila for certain strong papers. Caroa from Brazil, which is a leaf fiber, is being employed in some insulating papers. We are told that seed stocks from American hemp that is being grown in Kentucky, Minnesota and Wisconsin, will also yield some fiber for our industry. Even that old will-of-the-wisp, Ramie fiber, is again up for discussion and study. Crotolaria grass from South Carolina has been mentioned of late. There are also certain synthetic fiber wastes being used.

"It has been recently announced that the manno galactans will have some technical application in the industry.

"One of the large chemical companies has announced a new synthetic sizing material. It is an engine sizing agent used in conjunction with rosin.

"It is claimed that, with this material, it is possible to obtain the same degree of engine sizing with as little as 25 per cent as much rosin at a lower cost and often a substantial increase in sizing at no additional cost.

"The small housing field in the postwar era, may employ considerably more paper. . . . Combinations of resin impregnated corrugated board are being suggested as structural entities, incorporating the properties of water resistance, fire retardance, decay resistance, and insulating properties.

"In the past few months, an ingenious laminated paperboard has come to the market, which is lined on both sides with asbestos and has been approved as a nonmetallic material by the insurance underwriters for heating ducts.

"Paper is also being considered by the Office of Production Research and Development in the War Production Board, for pressure pipe.

"These examples are a few of the developments and trends that have been forced upon us in this emergency. We must keep abreast of them. They spell new markets and profits for the peace.

"Our industry will emerge from the War with newly discovered abilities, with a rightful pride in its war record, and with confidence and vision will turn its shoulder to the task of postwar planning and action."

GROUP MEETINGS

The mornings of the second and third days of the convention were given over to group meetings. On the morning of the second day, there were group meetings on Board, Fine Papers, Coated Papers, and Kraft; on the morning of the third day, on Chemical Pulp, Tissue Paper, on Finishing, Storing and Shipping, and Power and Plant Engineers.

The chairmen of the various group meetings were: Ollie W. Messner, Robertson Paper Box Co. (Board); Homer H. Latimer, Champion Paper & Fibre Co. (Fine Papers); Loring W. McFail, Oxford Paper Co. and Norman Bearse, Champion International Co. (Coated Papers); T. E. Dial, Socony-Vacuum Oil Co. (Kraft); Luther C. H. Beighey, Hammermill Paper Co. (Chemical Pulp); Walter Johnson, Hoberg Paper Mills (Tissue Paper); Raymond L. Barton, Michigan Paper Co. (Finishing, Storing and Shipping); and Raymond F. Bennett, Ecusta Paper Corp. (Power and Plant Engineers).

A. C. Lutz, B. F. Goodrich Company, was scheduled on the programs of both the Board and Fine Papers Meetings. His assignment before the Board Group included a paper on "Recent Developments in the Rubber Crisis," and the showing of a sound film entitled "How Industry Uses Rubber;" before the Fine Papers Group, a paper entitled "Rubber and Rubber Synthetics."

In addition, the program of the Board Meeting included a paper by Fred S. Crysler, Container Corporation of America, on "Current Operating Problems and Developments in a Paperboard Mill;" that of the Fine Papers Meeting, a paper on "Tub Sizing" by Samuel R. Olsen, Champion Paper & Fibre Company.

The program of the Coated Paper Group Meeting was arranged to discuss the casein problem and how to meet it as well as for a discussion of pertinent questions concerning clays, starches, fillers and colors.

▶▶▶ Two papers were on the program of the Kraft Meeting.

The first of these papers was presented by Ralph Kumler of the American Cyanamid & Chemical Co. His subject was "Wet Strength Resin for Stock Addition" and concerned largely a new resin which has been developed from melamine and formaldehyde. Through the incorporation of this resin in the stock, Mr. Kumler brought out that it not only imparts wet strength but also increases dry burst ing and tensile strengths, improves folding endurance, and moderately enhances the water resistance of rosin or wax sized papers but scarcely affects the absorbency of waterleaf papers.

The second paper on the program of the Kraft Group Meeting was on "The Use of Waxes and Wax Emulsions in the Waterproofing of Kraft Papers." It was presented by R. B. Killingsworth of the Socony-Vacuum Oil Co.

After explaining the meaning of the terms—water repellency, waterproofness, and moistureproofness—Mr. Killingsworth discussed procedures for both dry waxing and wet waxing and also laminating.

▶▶▶ John H. Noble, Improved Paper Machinery Corporation, and Ferri Casciani, Niagara Alkali Company, were on the program of the Chemical Pulp Meeting. The subject of Mr. Noble's paper was "Modern Trends in Washing Equipment;" of Mr. Casciani's, "Bleaching."

▶▶▶ Three papers and a showing of films made up the program of the Tissue Paper Meeting. The papers and respective authors were as follows: "Facts Concerning the Life and Care of Fourdrinier Wires," W. E. Buchanan, Appleton Wire Works; "Tissue Machines," G. E. Goodwillie, Beloit Iron Works; and "Raw Materials," Arthur Schmalz, Thilmany Pulp & Paper Co. The subjects of the films were: "Flows of Dust and Air Streams in Various Ducts," and "Dust Collection Equipment." These films were shown by J. A. McBridge of Buell Engineering Co.

▶▶▶ The papers on the program of the Finishing, Storing and Shipping Meeting included "Surveys as an Aid to Moving Pulp and Paper Faster with Limited Manpower and Equipment," by Edward Southworth, Towmotor Corporation; "Some Aspects of Post-War Handling of Materials in Pulp and Paper Mills," by R. L. Smith, Automatic Transportation Co.; and "Paper Shipping and Storing Practices," by John G. Bucuss, Acme Steel Company.

Among the suggestions made by Mr. Southworth were the following:

"Urge your truck operators to be alert for improvements and to suggest ways of doing more.

"A materials handling tour of your mill, department by department, will show where the heavy tonnage is moved, where congestion is apt to occur and whether or not that congestion is the fault of the materials handling equipment or of some piece

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of production machinery that may constitute a bottleneck.

"A well planned system for hand operated equipment brings the same relative advantages of full utilization of equipment and saving of manpower as does planning for the fully mechanized type. Furthermore, the knowledge such systematizing gives of production rates and man-hour requirements for handling materials in accordance with those rates, permits complete planning for and speedy installation of a mechanical system as soon as equipment is available."

The remarks of Mr. Bucuss were in the form of a progress report of the Sub-committee on Storing and Shipping. As chairman of this committee, Mr. Bucuss said, in part, that as a result of committee effort, it has been possible to assemble and correlate various papers written by members of the industry who have had a large experience in these respective phases; that the complete data, which ultimately will be published, will cover practices that have been tried and proved successful over many years; and that this book should be used as a guide for discussion with your plant organizations in promoting their programs for "Job Instruction Training" and "Methods Instruction Training."

A number of articles planned for use in the book were exhibited at the meeting in the form of a mimeographed volume under the title "Paper Shipping and Storage Practices."

▶▶▶ Five papers were scheduled for presentation before the group meeting of Power Plant Engineers.

The first of these papers was on the subject of "Salvage of Materials at KVP." It was presented by Ralph S. Clark of KVP's Engineering Department. To better visualize the extent and variety of the salvage operations, the presentation was made with the help of a large number of slides.

In resumé, Mr. Clark emphasized the following points:

1) Systematic collection, sorting, cleaning and repair of all equipment taken out of service.

2) Quick decision on whether to save a complete machine or salvage it. Salvage means the breaking up into its component units, scrapping and selling useless parts, and reconditioning usable parts.

3) Through expeditious selection and purchasing—limit yourself to a few or one maker of individual units for the sake of reconditioning, repair and reuse in many places or many machines.

4) The reconditioned parts must be clean, protection painted, kept where they can be seen easily and gotten at, to expect a mechanic to hunt them up.

This group, each from a different state, exchanged greetings. L to R: C. E. Libby, New York State College of Forestry; John V. Ziemann, Marinette Paper Co.; Raymond F. Bennett, Ecusta Paper Corp.; Gordon K. Singletary, Brunswick Pulp & Paper Co.; F. G. Calkin, Virginia Smelting Co.

The remaining papers on the program of Power and Plant Engineers Meeting were: "The Importance of a Recovery Unit as Steam Generating Equipment in the Pulp Mill," by F. H. Rosencrants, Combustion Engineering Co.; "Power Plant Operation and Maintenance," by G. H. Suhs, Sorg Paper Company; "Phenolic Materials Meet War Time Demand of Paper Industry," by Frank W. Vogt, Joseph T. Ryerson & Son, Inc.; and "Maintenance of Steam Heater Sections," by W. K. Metcalfe, J. O. Ross Engineering Corporation.

Mr. Vogt discussed such applications for phenolic materials as bearings for press rolls, bottom calender rolls, beaters, and jordans, as well as for suction box covers, and doctor blades. He called attention to the long bearing life of Ryertex type material when operating in wet places or where water can conveniently be used instead of grease or oil—mentioning that in such places bearing life has been increased as much as ten times.

Due to a bad heater situation as of this date, Mr. Metcalfe pleaded for the mills to do everything possible to take care of the heaters they now have. He said that the two most common troubles encountered with heaters in the mills are corrosion and freezing; that corrosion is usually caused by poor quality steam; that freezing, in the majority of cases, is caused by air bound heater sections, and that it is very important to follow the manufacturers' recommendations when an installation is being made.

One of the outstanding features of each of the group meetings beyond that of formal paper presentation was extended discussion of numerous questions of specific interest to the individual group.

PANEL DISCUSSIONS

Two panel discussions—one on "Pulpwood Supply" the other, on "Women in Paper Mills" also proved to be features of special significance. The first of these features followed the presentation of the paper by E. W. Tinker; while the second followed the address of Miss Davies.

E. W. Tinker served as co-ordinator of the panel discussion on Pulpwood Supply; while A. S. Anderson, Personnel Director, Champion Paper & Fibre Company (Hamilton, Ohio), was co-ordinator of the panel discussion of "Women in Paper Mills."

Panel members serving with Mr. Tinker included S. G. Blankinship, production manager, Port Royal Pulp & Paper Company; H. E. Brinckerhoff, executive secretary, American Pulpwood Association; Kendrick Burns, manager, Woods Department, S. D. Warren Company; Arthur Schmaltz, assistant general superintendent, Thilmany Pulp & Paper Company; and Niles M. Anderson, Ontonagon Fibre Corporation. A. B. Hansen, Northern Paper Mills, also took a very active part in the panel discussion.

The panel members listed on the program to serve with Mr. Anderson

Em no mekim peper 'long Sawt Pacific!

Ask the Marines...they know what that Pidgin English means...

"They don't make paper in the South Pacific."

But a lot of paper is used on all of our war fronts, afield and at home. Paper products are doing their full share to win this war... tough, weatherproof corrugated shipping boxes, weatherproof solid fiber containers, paper boxes, and just paper in its many forms.

We are proud that the Stein-Hall Starch Combining Process and our line of materials for the paper industry are helping to make high quality paper products fit for serving our fighting men and women.

Due to war conditions limiting raw materials, not all of our standard products for paper processing are readily available.

But backed by our experience in serving the Paper Industry for 77 years, our Paper Laboratories have developed alternate materials to serve the same purposes and are ready to do their best to help you solve your wartime problems.

If you'd like an original suitable-for-framing print of Brussel-Smith's wood engraving (right), drop a line to Stein-Hall.

77 YEARS OF STARCH SERVICE

STEIN HALL

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FOUNDERS — STEIN-HALL RESEARCH FELLOWSHIP AT THE INSTITUTE OF PAPER CHEMISTRY, APPLETON, WIS.

At the luncheon meeting on the first day of the convention, S. D. Kirkpatrick, editor of Chemical & Metallurgical Engineering, was the guest speaker.

were: Miss Ellen M. Davies, personnel director, Chase Brass & Copper Company; Oscar Stamets, personnel director, Riegel Paper Corporation; Edward A. Jackman, assistant personnel director, Oxford Paper Company; Ralph H. Kehl, personnel superintendent, Kimberly-Clark Corporation (Niagara Falls, N. Y.); E. G. Amos, secretary, Industrial Relations Committee, American Paper and Pulp Association; and George J. Adams, personnel director, International Paper Company.

Luncheon and Dinner Addresses

The program included a luncheon on the first day of the convention, a dinner on the evening of the second day, and a luncheon on the third day.

The guest speaker at the luncheon on the first day was S. D. Kirkpatrick, editor, *Chemical & Metallurgical Engineering;* at the dinner meeting on the second day, Honorable Ralph O. Brewster, U. S. Senator from Maine; and at the luncheon on the third day, Otto D. Tolischus, foreign correspondent and author of "They Wanted War" and "Tokio Record."

Mr. Kirkpatrick spoke on "Mobilizing Science and Technology for the War and Post-War." He mentioned briefly that the requirements of war have brought about improved packages; that paper is a strategic material; that today a definite scarcity is clearly visible; and that a few years ago we took too much for granted but that now we have mobilized both science and technology in the development of products to the winning of the war. In closing his remarks, Mr. Kirkpatrick said, "Today's scarcities are tomorrow's surpluses."

Senator Brewster, in his address at the dinner meeting of the second day, most eloquently and forcefully presented a "Progress Report" of governmental activities in Washington as he views them. The situation in his opinion is not entirely pessimistic. He asked his audience to think back to the days of the Pilgrims, to Colonial Days, to the days of the Revolution, to the War between the States and also to see America as the heir to the ages. He related that American arms have gone steadily ahead since Pearl Harbor; that mobilization of industrial power has gone forward; that business must take more and more interest in government during the next decade; that he has supreme confidence in the virility of American industry, and that he has profound faith in the destiny of America.

He concluded his stirring address with a few lines from a poem by Henry Van Dyke:

The world is round and God is everywhere,
And while our shallop floats we still can steer.

So point her up, John King, nor'west by north
We'll keep the honour of a certain aim
Amid the peril of uncertain ways,
And sail ahead, and leave the rest to God.

"...on Both Fronts"

"Our Enemies on Both Fronts" was the luncheon address subject of Mr. Tolischus. At the outset, he said that the paper industry is a basic industry of civilization; and that he had often hoped for an invention of some kind that would cause paper to blush or some other such thing when lies are printed upon it. The tremendous military machines of our enemies, he said, have been built up on lies. Truth, however, he continued, prevails in the end.

Mr. Tolischus related that the United Nations are now on the offensive; and that after initial victories, the Japs have been stopped. In making these statements, Mr. Tolischus added, that war to him is not a mathematical calculation but a contest just as is a football game. Victory, he said, is not won until the last play is made.

In looking at Germany's situation today, Mr. Tolischus related that Hitler controls a continent and some 300 million people; that neither Hitler nor the Nazi regime are willing as yet to throw up the sponge; that Hitler himself said that Germany was prepared to fight a seven year war; that air power is one of our major weapons; and that only events can tell if war in Europe can be won this year.

The situation in the Pacific, continued Mr. Tolischus, is different. Japan, he said, also prepared for this war for a long time. Her technical equipment, related Mr. Tolischus, is not such that she can perform miracles, however, the longer time she gets, the more she can develop, with plenty of German experts to help her.

No matter how you figure it, Mr. Tolischus believes that the war with Japan must be figured in terms of years. He said that the Japanese are strong on morale; that they have a somewhat different attitude about life and death than do Western peoples; and that they are cruel, treacherous, and savage.

In the concept of Mr. Tolischus, the Japanese is the only savage who has mastered the machine. If we are going to march into Tokio, we will have to fight hard, he commented.

In contrast to Germany, Mr. Tolischus does not believe that Japanese morale will crack. Before Germany collapses, however, he expressed the belief of a possible blood bath within the country itself.

Whatever the course of the war, concluded Mr. Tolischus, there can be no peace on earth until this world of savagery has been crushed into dust and ashes—an unconditional surrender for all of the axis powers.

THERE are many men in the paper industry who have long been familiar with the real merits of RICHLAND TRIPLEX All Cotton Dryer Felts. They know the value of the strong sturdy yarns that make these heavy duty felts so serviceable and so economical. They like their smooth, uniformly woven contact surfaces, so important in the manufacturing of better qualities of paper. Because they have a high degree of porosity, they have witnessed lower steam consumption with RICHLAND TRIPLEX. They have experienced the relation of fewer production delays to the small amounts of shrinkage and stretch in RICHLAND felts. Yes! There is a whole host of paper production men, who know that RICHLAND TRIPLEX All Cotton Dryer Felts, not only turn in a top performance, but are like friends, they wear well.

MT. VERNON WOODBERRY MILLS, INC.

TURNER HALSEY COMPANY
Selling Agents
40 WORTH STREET ★ NEW YORK, N. Y.
CHICAGO · NEW ORLEANS · ATLANTA · BALTIMORE · BOSTON · LOS ANGELES · SAN FRANCISCO

Election of Officers

The officers elected for the coming year at the business meeting on the afternoon of the second day of the convention follow:

President — Stanford G. Blankinship

First Vice President—Raymond L. Barton

Second Vice President—Niles M. Anderson

Third Vice President—Homer H. Latimer

Fourth Vice President—Raymond F. Bennett

Fifth Vice President—Ollie W. Messner

At this meeting it also was announced that George Craigie, Field Secretary, has been appointed to serve for another year.

Other Convention Highlights

One of the most enjoyable features of the entire convention was the "Get Together Party" which immediately preceded the dinner on the evening of the second day. With the Allied Industries as hosts and a special Ladies' Committee, including wives of Association officials, as hostesses, the party brought everyone together in a spirit of comradery that made it easy to mingle and to become better acquainted.

Other pleasant incidents of the convention included the presentation of several life and honorary memberships in the Association and the presentations of the Past President's Jewel and the L. D. Post Trophy.

Life memberships in the Association were presented to Charles Champion and to George A. Thompson, Sr., by William Brydges. The Life Membership certificate of Mr. Thompson was accepted, in the absence of Mr. Thompson because of illness, by his son, George, Jr. Honorary memberships were presented to George W. Mabee, president, National Folding Box Company, New Haven, Connecticut, and to George W. Mead, President, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wisconsin, by Grover Keeth.

The past president's jewel was presented to Grover Keeth, retiring president, by Fred Boyce, first president of the Association and affectionately called Daddy of the Association. Grover Keeth also received the L. D. Post Trophy. It was presented to him by John Cornell of *Paper Mill News*.

At the dinner meeting where these presentations were made, there also were other presentations. A gold pencil set was presented to V. S. Denison, retiring chairman of the Affiliates, by Raymond F. Bennett in behalf of the Association. A brief case was presented to George Craigie, Field Secretary, by Grover Keeth; and there were likewise gifts for the wives of the retiring president and the incoming president. Mr. Blankinship, the incoming president, presented the gift to Mrs. Grover Keeth, wife of the retiring president; while Raymond L. Barton made the presentation to Mrs. Blankinship, wife of the newly elected president.

Convention Committees

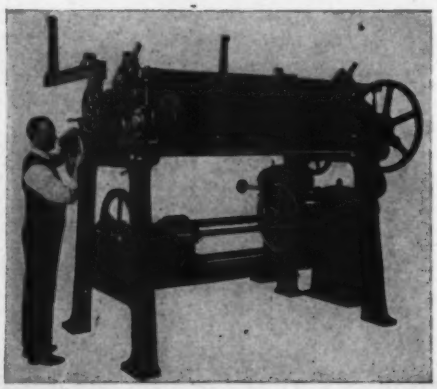
In addition to the convention advisory committee, consisting of Grover Keeth, S. G. Blankinship, F. C. Boyce, W. H. Brydges, and K. E. Terry, the convention committees and their personnel were as follows: *General Chairman*—Grover Keeth; *Convention Manager*—George W. Craigie; *Hospitality*—S. G. Blankinship, Raymond L. Barton, Niles M. Anderson, Homer H. Latimer, Raymond F. Bennett; *Local Activities and Information*—J. W. Hemphill, S. W. Fletcher, Lester Crouse, Ralph Kumler, T. E. Lagerstrom, A. McLintock, Fletcher Thornton; *Golf* (no tournament)—John H. Noble, Harold Burroughs, John Cornell, Robert Douglas, W. E. Greene,

Since 1828 . . .

we have served the industry well, with the finest in Paper Mill Machinery.

Now . . .

our Engineering Department and entire manufacturing facilities are devoting every effort to turn out the mightiest and most formidable fighting machine our country has ever known. While we cannot give you typical peacetime S&W Service, we can supply you with replacements — under proper priority rating, of course.



ROTARY SPOT CUTTER—All anti-friction bearings—for cutting preprinted rolls of paper to mark—manual or automatic photoelectric control.

•

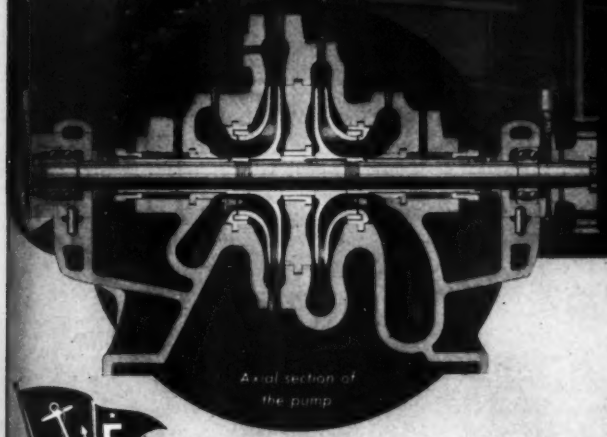
Other SW Products—Undercut Trimmers—Rainstorm Shower Pipes—Stuff Pumps—Bag Machinery—Jordans—Cylinder and Fourdrinier Machines.

THE SMITH & WINCHESTER Manufacturing Company

SOUTH WINDHAM • CONNECTICUT

RIGID INSPECTION AND TESTING — Insure High Quality

Opposed impeller centrifugal pump on test



Axial section of the pump

The highest quality of engineering design and of workmanship has always been the ideal of the De Laval Steam Turbine Company. High grade machines can be produced only by care in selecting and purchasing materials and by the use of specialized equipment, including precision tools, gages, jigs and measuring devices, followed by limit-gage inspection of finished surfaces and by thorough testing of completed units.

The testing here shown of a two-stage De Laval Pump is typical of the routine testing of De Laval centrifugal pumps. The pump is driven by a calibrated motor and accurate readings are made of speed, pressure, delivery and power consumption over the working range. The unit is then dismantled and all working surfaces are again inspected and checked. In some cases a torsion meter is used for determining input.

A similar procedure is followed with De Laval steam turbines, helical and worm gears, centrifugal compressors, and rotary displacement oil pumps.

The testing equipment includes suitable gages and meters for measuring power and fluids of all kinds and at various pressures and temperatures, also plant for generating steam at high pressure and temperature and for producing high vacuum.

M-34

DE LAVAL *Steam Turbine Co.*
TRENTON, N. J.

MANUFACTURERS OF TURBINES STEAM HYDRAULIC PUMPS CENTRIFUGAL CLOGLESS ROTARY DISPLACEMENT, MOTOR MOUNTED, MIXED FLOW, PROPELLER PRIMING SYSTEMS CENTRIFUGAL BLOWERS and COMPRESSORS GEARS WORM HELICAL and FLEXIBLE COUPLINGS

Western Div. Salesmen's Ass'n honors George K. Gibson on Charter Members' Day.

"Charter Members' Day" was observed by the Salesman's Association of the Paper Industry at Hotel Sherman, Chicago, on June 7. A special meeting had been arranged with an extra special luncheon. The main speaker and guest of honor was George K. Gibson, sales manager of the Mosinee Paper Mills Company. Mr. Gibson is recognized as the founder of the Association which was organized in 1920, and he was its first president. On this special occasion of "Charter Members' Day," which was also Mr. Gibson's 74th birthday, there was a beautiful birthday cake, with candles, and Mr. Gibson was presented with a bound volume containing letters from 76 of his associates in the paper industry wishing him a happy birthday. Mr. Gibson is seated in the center of the front row of the picture (wearing bow tie).

John Loomis, David Murchisan, Norman Weil; *Ladies' Committee*—Mrs. Grover Keeth, Mrs. S. G. Blankinship, Mrs. John Cornell, Mrs. J. W. Hemphill, Mrs. W. H. Brydges; and *Affiliates Committee*—V. S. Denison, T. E. Dial, John H. Noble, S. W. Fletcher, T. E. Lagerstrom, John Cornell.

◆

CONVENTIONS AND COMING EVENTS

Sept. 21-24—Technical Association of the Pulp and Paper Industry, Fall Meeting, Palmer House, Chicago.

Oct. 5-7 — 32nd National Safety Congress and Exposition, Hotel Sherman, Chicago.

Dec. 6-11 — 19th Exposition of Chemical Industries, Madison Square Garden, New York City.

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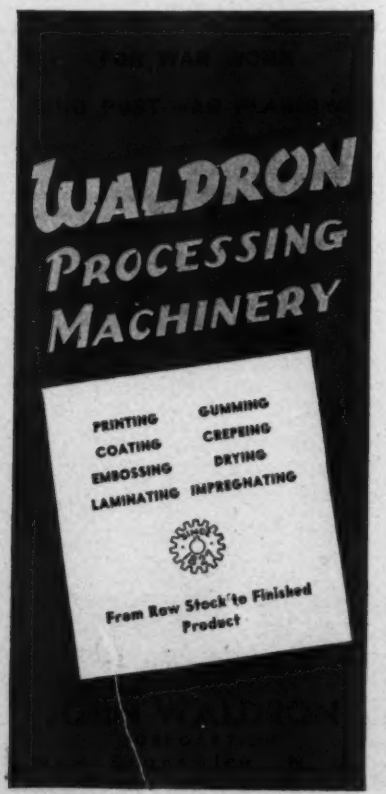


PULP CONSUMERS ASSOCIATION MAKES RECOMMENDATIONS

Eight recommendations have been approved by the board of the Association of Pulp Consumers, Inc., Washington, D. C., and submitted to Arthur G. Wakeman, director of the Pulp and Paper Division of the War Production Board. The purpose of these recommendations is to make available sufficient wood pulp to provide adequately for military and civilian needs, and to assure an equitable distribution of the declining supply of wood pulp. The recommendations are as follows:

1) That each government agency give every possible assistance in making available the manpower, trucks, gasoline, operating supplies, etc., necessary to produce and transport an adequate supply of pulpwood for use of both the market and integrated domestic wood pulp mills.

2) That exports of wood pulp be restricted to the quantities necessary for non-paper uses, and that wood pulp intended for the production of paper and paperboard in other countries be processed into paper and paperboard in the United States and exported as paper and paperboard in cases where such a procedure will assist in preventing the closing of domestic paper and paperboard mills.

3) That all wood pulp required for nitrating, Lend-Lease and other government sponsored nondomestic paper uses be furnished by the integrated pulp mills and the market pulp mills in accordance with their percentage of the total domestic wood pulp production.

4) That consumers of paper and paperboard be required, through the adoption of simplification and other programs, to conserve virgin wood pulp by substituting papers and boards using less virgin wood pulp wherever possible.

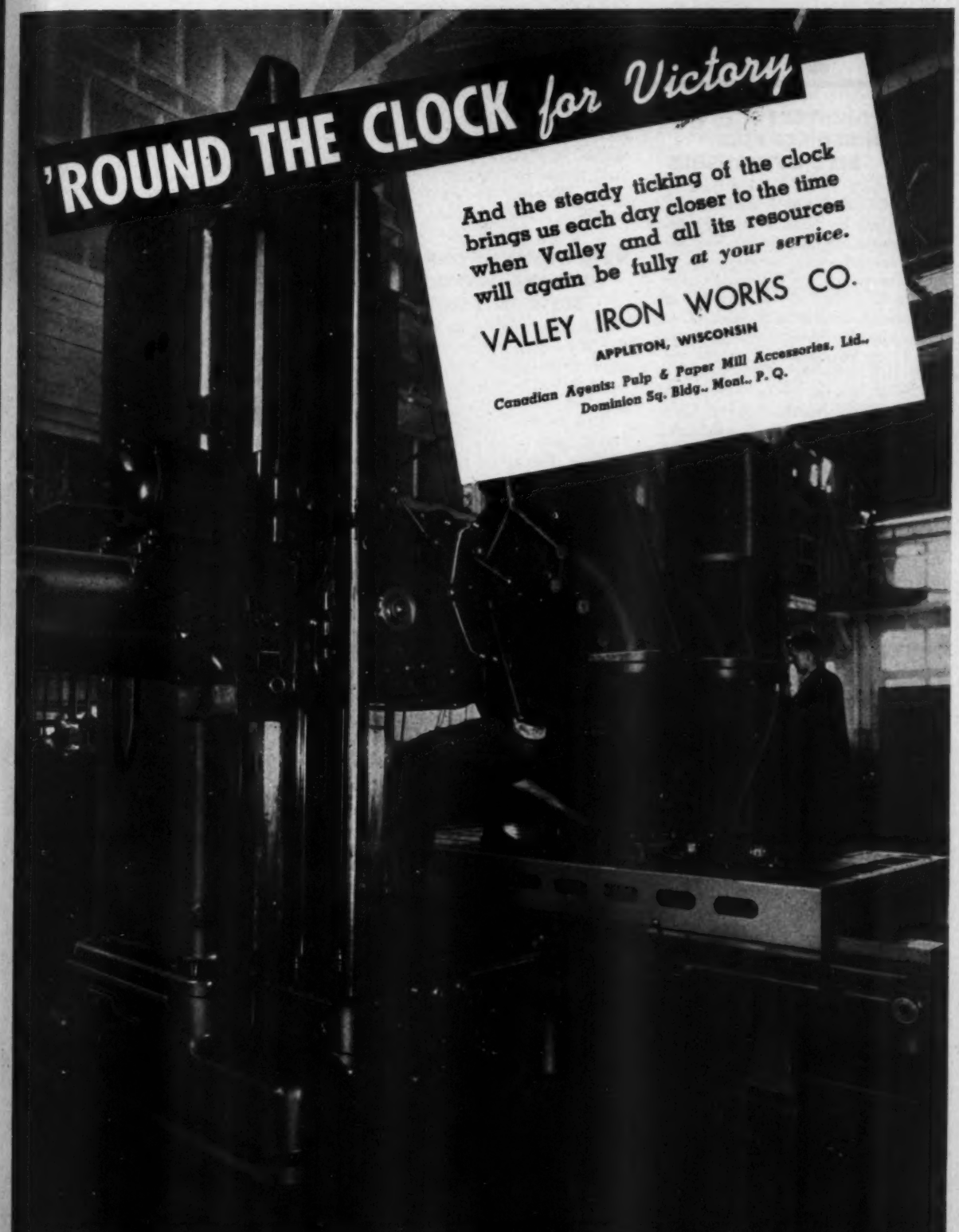
5) That the wood pulp available for the domestic production of paper and paperboard be allocated in accordance with the essentiality of the papers and boards produced by the individual paper and paperboard mills, giving due consideration to the quantity of paper or paperboard which can be produced from a given quantity of wood pulp.

6) That paper and paperboard mills using increased quantities of substitute fibrous materials be rewarded by permitting them to operate additional machine hours in proportion to the increased use of substitute fibrous materials, and that no paper or paperboard mill be penalized in its supply of virgin pulp because of its increased use of substitute fibrous materials.

7) That as long as substitutions for virgin wood pulp are necessary all orders and specifications which discourage the use of substitute fibers should be revoked or modified so as to permit the maximum use of substitute fibers.

8) That all restrictions be removed from the manufacture of papers and paperboards which do not contain virgin wood pulp.

The Association of Pulp Consumers, Inc., is one of the newest associations to enter the field (it was incorporated in March, 1941), but it claims more individual member mills than any other paper or paperboard association in the United States. George R. Wallace, president of the Fitchburg Paper Company, Fitchburg, Massachusetts, is president of the Association.


'ROUND THE CLOCK for Victory
And the steady ticking of the clock brings us each day closer to the time when Valley and all its resources will again be fully at your service.
VALLEY IRON WORKS CO.
APPLETON, WISCONSIN
Canadian Agents: Pulp & Paper Mill Accessories, Ltd., Dominion Sq. Bldg., Mont., P. Q.

Slices and Head Boxes • Screw Presses • Micro-Mist Spray Dampeners • Laboratory Equipment
Pulp Washing Systems • High-Speed Beaters • Breaker Beaters • Vortex Beaters • Plug Valves
Sutherland Refiners • Flat and Rotary Screens • Thickeners • Deckers • Paper Markers • Roll-Headers

ALLIED

NYLON BRISTLES DOUBLE SERVICE LIFE OF BRUSHES

The service life of brushes used by the paper industry to impart the required gloss to glassine and greaseproof papers has been doubled by the use of nylon bristles, according to an announcement by the Plastics Department of E. I. du Pont de Nemours & Company, Wilmington, Delaware.

These large cylindrical brushes range from 12 to 14 inches in diameter and 80 to 107 inches in width, and they revolve at speeds up to 1,000 rpm when applying a solution on the paper as it is fed through rotary machines. Nylon not only outwears scarce natural bristle, but it does not soften in contact with various water solutions so that the bristles break off or pull out.

Nylon bristles are replacing natural bristle in gun-cleaning brushes for the Navy, ammunition shell case cleaning brushes, toilet brushes, and many industrial brushes.

◆

CHICAGO BRIDGE & IRON HOLDS SHIP LAUNCHING CEREMONY

Just one year ago, the present site of the Seneca, (Illinois,) shipyard of the Chicago Bridge & Iron Company was a pasture. Today it is building ocean-going tank-landing ships known as LST ships.

A launching of one of these ships whose keel had been laid less than seven months ago was held at the shipyards on June 5. The ceremony was presided over by Merle J. Trees, executive vice president of the company, and George T. Horton, president, made the address of welcome, responded by C. Earl Webb, president, Western Society of Engineers. Mrs. Charles S. Pillsbury acted as sponsor. Reverend Ralph C. Lane, Seneca, gave the invocation. Commander Paul S. Goen, assistant supervisor of shipbuilding, U. S. Navy (retired), was present at the ceremony.

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▶▶▶ THE 1943-1944 EDITION of Barrell's *Paper Annual*, published by William L. Barrell Company, Lawrence, Massachusetts, has recently been issued. In addition to the directory of officials of paper industry associations, this 79-page publication contains a resumé of "The Paper Industry in Wartime" by E. W. Tinker; "Paper's Part in War" by William Bond Wheelwright; "Paper Prevents Battlenecks" by Vincent F. Waters; and "Pulp and Paper Education at University of Maine" by Professor Paul D. Bray. A short resumé of dryer felts in wartime by the Barrell organization is also included.

◆

NEW STYRENE PLANT OF DOW CHEMICAL CO. NOW IN PRODUCTION

Full scale production was begun in the first unit of the new styrene plant of The Dow Chemical Company, located at Los Angeles, six weeks ahead of schedule.

This plant is part of three manufacturing units of the Synthetic Rubber Project. The second plant unit is being operated by the Shell Oil Company, which supplies the other major ingredient, butadiene, and the third unit is for the copolymerization process, which is being carried out by the Goodyear and Firestone Rubber companies.

High praise is due both Dow plant engineers and the construction company charged with the erection of the project for the sensational speed in carrying this plant from plans to full fledged production. This 15 million dollar unit was erected in less than 10 months.

◆

The Downingtown Manufacturing Company, Downingtown, Pennsylvania, published the first issue of its new house organ in June. Called the *D.M.C. News*, its pages are filled with short items about the activities of present employees of the company, as well as former employees who are now serving in the Armed Forces. All of those now in service, of course, will receive the publication regularly.

◆

NEW SCHAUB DIV. IN CHICAGO KNOWN AS MAGNETROL, INC.

The Fred H. Schaub Engineering Company, Inc., Chicago, has recently announced the organization of a new division known as Magnetrol, Inc., which will assume complete control of the manufacture and sale of *Magnetrol* automatic liquid level control units.

E. J. Snetsinger has been appointed general manager of the new division, located at 325 West Huron Street, Chicago 10. According to Mr. Snetsinger, the *Magnetrol* was originally developed as a boiler water level control unit for the Schaub systems; however, during the past two years the application of the instrument to other types of industrial liquid level control problems has so increased that it was necessary to establish new manufacturing and sales facilities.

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▶▶▶ GENERAL ELECTRIC COMPANY, Schenectady, New York, has prepared a small book for presentation to its employees entering the armed services. As at the present time, inductees are given only one week to arrange their personal affairs, this booklet was prepared as an aid in making these arrangements as quickly and easily as possible. Entitled, "To our Men Entering the Armed Forces," the first chapter of the booklet pertains to matters within the company, while the other two chapters deal with the handling of problems common to everyone.

◆

WOODWARD, BALDWIN NOW SOLE AGENTS FOR BRANDON FELTS

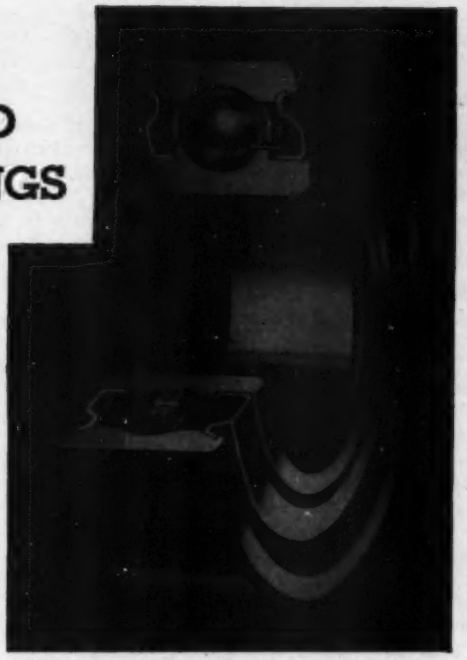
The Brandon Corporation, Greenville, South Carolina, has announced that Woodward, Baldwin & Company will assume the sole selling agency for the distribution of the Brandon Dryer Felts to the paper mill trade.

Woodward, Baldwin & Company have sold the product of the Brandon duck mills since this mill was built in 1922, but due to the fact that Walter G. Morey, of Boston, had had wide experience in Dryer felts, his firm, the Morey Paper Mill Supply Company, for some time acted as the sole selling representative of Brandon Felts through Woodward, Baldwin & Company. The Morey Paper Mill Supply Company later moved to Fitchburg, Massachusetts, and just recently became connected with the Fitchburg Duck Mills (Cf. THE PAPER INDUSTRY AND PAPER WORLD, June, 1943, p. 282). Due to this competitive connection, Brandon Felts are now being sold by Woodward, Baldwin & Company direct and through sub-agents to the paper mills.

When Woodward, Baldwin & Company was organized in 1828, the American Cotton Textile Industry was in its infancy. Baltimore was strategic—it was the gateway to the fields of cotton, and the big mills of Philadelphia and New England were located within easy reach. This company has survived four great wars and is serving industry during the fifth—the greatest of them all. It has truly survived 115 years of war—and peace.

About 1900, Brandon Corporation first built an unbleached sheeting mill with approximately 45,000 spindles

SELF-SEALED BEARINGS



"9000-DD", with Double Metal Seals, here shown; also made as "9000-D" with Single Metal Shield.

"NORMA-HOFFMANN"
PRECISION BEARINGS
BALL, ROLLER AND THRUST

LARGER GREASE CAPACITY NO SEAL DRAG

IN "9000" SERIES (Feltless)

Interchangeable in dimensions with felt seal bearings.

Employs simplified, inwardly extending, flanged metal shields which do not rotate and cannot "foul" other rotating seal parts.

Seals are highly efficient in retaining grease in either horizontal or vertical position.

Simple seal occupies less space within bearing than felt seal, PROVIDING GREATER GREASE CAPACITY AND A MORE LASTING LUBRICANT SUPPLY.

Metal seals, though close fitting, clear recess on inner ring, ELIMINATING "DRAG" OR FRICTIONAL RESISTANCE and power loss, and providing higher starting speeds and increased efficiency. Seals cannot wear and are permanently effective.

Totally sealed against foreign matter, providing absolute cleanliness at all times.

NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONN., U.S.A.

UNIVERSAL SAFETY

How About Cutting Expenses and Avoiding Production Delays?

The accident rates of National Safety Council members average only 50 to 60 per cent of the rates of non-members in comparable industries.

Because of this you can readily visualize the savings and other benefits which can accrue to your Company from a conscientious use of the Council's Accident Prevention Services.

For details, just address a request on your Company's letterhead to:

Paper and Pulp Section
National Safety Council, Inc.
20 N. Wacker Drive, Chicago 6, Ill.

You will also receive a complimentary copy of our Accident Facts Memo. No. PP-1, "Hand Tool Accidents in the Paper Industry."

and a complement number of looms. Since then, the Brandon plant has been doubled in size, with approximately 90,000 spindles at present. The company also has acquired the Poinsett mill with 27,000 spindles, and the Woodruff mills with 45,000 spindles. It has built the Renfrew Bleaching and Finishing Plant, and in 1922 built the Cotton Duck Mill where the paper mill dryer felts are made. The company has had three presidents, all of Greenville, South Carolina: J. W. Westervelt, August W. Smith, and C. E. Hatch, its present presiding officer.

The Brandon Corporation regrets its inability to supply Brandon Scapa-Hall asbestos felts for the duration due to an interruption in the supply of asbestos.

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▶▶▶ THE FIRST ISSUE OF *The Brake Shoe Party Line* has just been released by the American Brake Shoe Company, New York City. It is the aim of the company to create, through this magazine, as the title indicates, the neighborly party-line atmosphere among the customers and friends of the various divisions of the company reminiscent of the old-time telephone party line.

◆

NEW MAGNESIUM METAL PLANT IN PRODUCTION

The newly erected magnesium-chlorine plant in Louisiana has begun production of magnesium metal, according to an announcement by the operating company, the Mathieson Alkali Works, Inc., New York City.

This plant is owned by the Defense Plant Corporation. The design and engineering of this project are said to be unique.

◆

QUIMBY PUMP CO. IS BOUGHT BY THE H. K. PORTER CO.

The Quimby Pump Company, with plants at Newark and New Brunswick, New Jersey, has been purchased by H. K. Porter Company, Inc., of Pittsburgh, Pennsylvania.

The Quimby plants will be operated as a division of the Porter company, according to T. M. Evans, president. They manufacture a full line of pumps, including screw, centrifugal, and rotex types used in industry, and at present are also building considerable quantities of pumps for both the Navy and Maritime Commission. Mr. Evans said that the purchase of the Quimby Pump Company was made to further diversify H. K. Porter Company's line of products.

Chicago Bridge & Iron Company, Chicago—Colorful ceremonies on June 12 marked the awarding of the Army-Navy "E" pennant to the Seneca, Illinois, plant of this company. The company is turning out LST ships at its Seneca shipyards. Captain Wallace R. Dowd, U.S.N., presented the pennant to George T. Horton, president, while Major Howard C. Meadors, U.S.A., presented the lapel insignias to Joseph Madura and representatives of the plant personnel. The program concluded with the christening of a ship by Miss Katherine Trees. Charles S. Pillsbury acted as master of ceremonies.

DeLaval Steam Turbine Company, Trenton, New Jersey—Another star has been added in the Navy "E" flag of this company, for the Navy Board for Production Awards recently granted a second renewal of the initial award. The first star was added six months ago (Cf. THE PAPER INDUSTRY AND PAPER WORLD, April, 1943, p. 50), and this second renewal carries with it the right to fly the Navy "E" burgee with two stars.

Foster Wheeler Corporation, New York City—For the fifth time, employees of this company were honored for maintaining high production achievement. On May 14, Rear Admiral Clark H. Woodward conferred the Army-Navy "E" pennant with two stars upon the Carteret, New Jersey, plant. Lieutenant Commander W. S. Downs, assisted by Lieutenant H. C. Ressler, U.S.A., presented lapel pins to representatives of the shop personnel. Lieutenant Commander J. Douglas Gessford, Jr., acted as master of ceremonies. The first renewal of the award to this plant was made six months ago (Cf. THE PAPER INDUSTRY AND PAPER WORLD, Feb., 1943, p. 1136).

Link-Belt Company, Chicago—The Ewart plant of this company, located in Indianapolis, now proudly flies the Army-Navy "E" pennant, symbol of excellence in production of vital war materials. Presentation ceremonies were held June 17 at the Washington High School athletic field, adjacent to the plant, and approximately 6,000 employees, relatives, and friends were present when Colonel F. W. McMahon, chief, Cincinnati Ordnance District, awarded the pennant. Frank S. O'Neil, Link-Belt vice president and general manager of the plant, accepted it on behalf of the workers at Ewart. Captain E. E. Roth, Bureau of Ships, Washington, D. C., assisted by Private Fred Paine, pinned lapel insignias on eight of the plant's oldest "productioneers," as representatives of all employees. Speech of acceptance of the "E" pins was made by Walter Craigle, president, Link-Belt Local No. 1150. Kurt F. Pantzer acted as master of ceremonies, and James S. Watson, Link-Belt vice president, gave the welcoming address.

SAFETY

SAFETY SCORES

In the annual paper industry safety contest, seven mills of those participating report perfect scores for May. The mills with a no-accident record are:

Division I—Pulp and Paper Mills

Groups A, B, and C (None)

Group D—

Marathon Paper Mills Co., Ashland, Wis.

American Writing Paper Corp., Holyoke, Mass. (Mt. Tom Div.)

Alton Box Board Co., Carlyle, Ill.

International Paper Co., Riley, Me. (Riley No. 23).

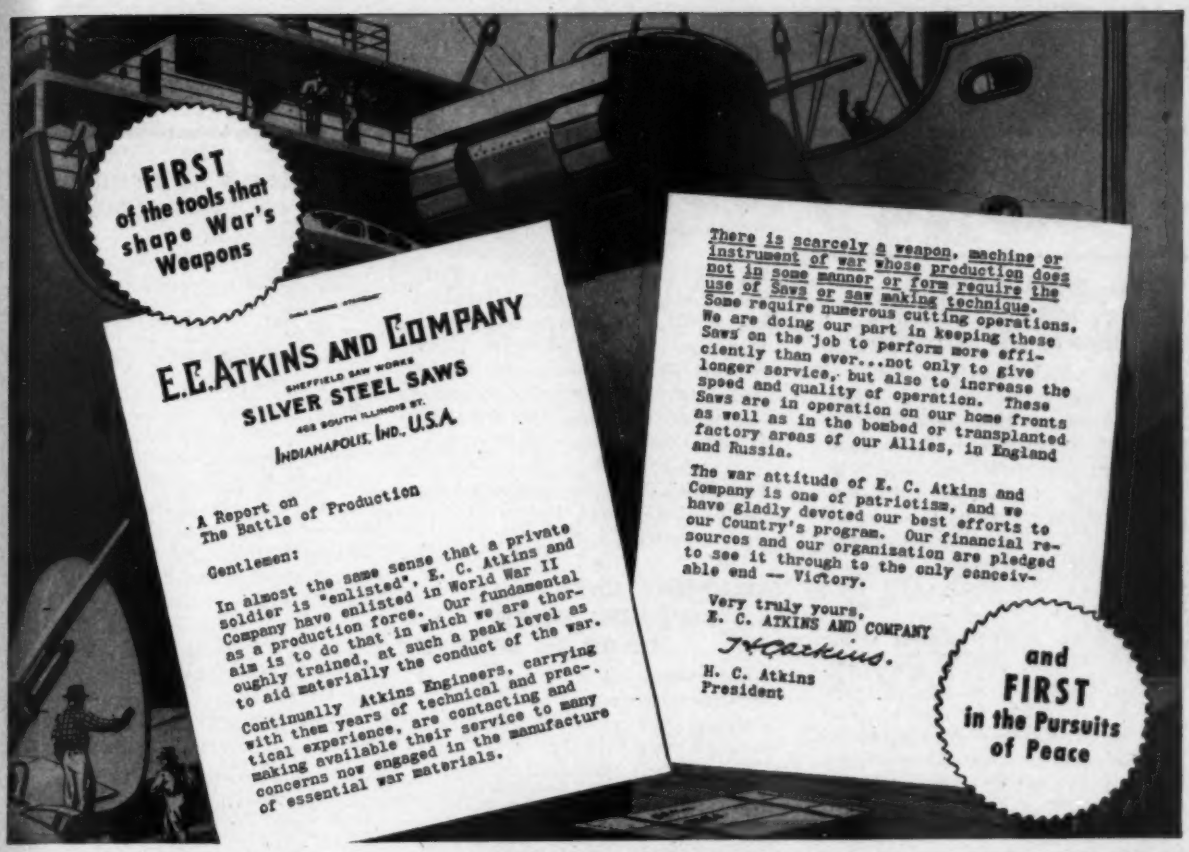
Division II—Paper and Board (Re-manufacturing)

Thilmany Pulp & Paper Co., Kaukauna, Wis. (Bag Mill).

South West Box Co., Sand Springs, Okla.

Bay West Paper Co., Green Bay, Wis.

The paper industry safety contest is conducted among member mills of the Paper and Pulp Section of the National Safety Council, and runs for twelve months. The present contest covers the period July 1, 1942 to June 30, 1943.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A Report on
The Battle of Production
Gentlemen:
In almost the same sense that a private soldier is "enlisted", E. C. Atkins and Company have enlisted in World War II as a production force. Our fundamental aim is to do that in which we are thoroughly trained, at such a peak level as to aid materially the conduct of the war.
Continually Atkins Engineers, carrying with them years of technical and practical experience, are contacting and making available their service to many concerns now engaged in the manufacture of essential war materials.
There is scarcely a weapon, machine or instrument of war whose production does not in some manner or form require the use of Saws or saw making technique. Some require numerous cutting operations. We are doing our part in keeping these Saws on the job to perform more efficiently than ever...not only to give longer service, but also to increase the speed and quality of operation. These Saws are in operation on our home fronts as well as in the bombed or transplanted factory areas of our Allies, in England and Russia.
The war attitude of E. C. Atkins and Company is one of patriotism, and we have gladly devoted our best efforts to our Country's program. Our financial resources and our organization are pledged to see it through to the only conceivable end — Victory.
Very truly yours,
E. C. ATKINS AND COMPANY
H. C. Atkins
President
and
FIRST
in the Pursuits
of Peace

STOCK PUMPS INDIVIDUALLY DESIGNED TO MEET YOUR OPERATING CONDITIONS ★

Actually, there is no such thing as a "stock" FREDERICK Stock Pump . . . there is only a basic design. And, when we engineer your pump, we take into account the nature of the stock, its consistency, the piping layout, and all other factors that enter into your operating conditions . . . and build the pump accordingly.

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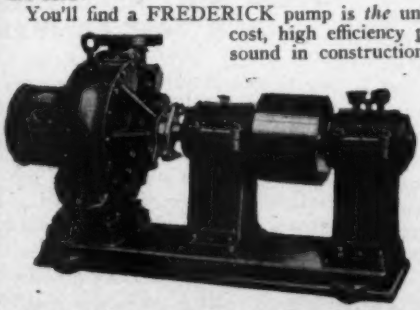
You'll find a FREDERICK pump is *the* unit for low cost, high efficiency pumping—sound in construction—dependable in operation—proved by over a quarter century's use by leading paper mills.



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NAMES *in the* NEWS

Personals

AMER. MANG. STEEL DIV. MAKES MULLIN SUPT. OF FOUNDRIES

Joseph L. Mullin has been appointed general superintendent of foundries for the American Manganese Steel Division of the American Brake Shoe Company. The foundries, which he will supervise from offices of the company at Chicago Heights, Illinois, are located at Chicago Heights; New Castle, Delaware; Oakland, California; Denver, Colorado; Los Angeles, California; and St. Louis, Missouri.

Mr. Mullin, works manager at the New Castle plant until his recent promotion, began work in 1914 with the then Edgar Allen Manganese Steel Company as clerk in the annealing department. He rose through successive stages to the positions of local purchasing agent and foundry superintendent, becoming works manager in 1928.

W. F. Kelly, plant superintendent at New Castle, has been named works manager to succeed Mr. Mullin. Mr. Kelly has been associated with the company since 1925.

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▶▶▶ The E. B. Eddy Company, Hull, Quebec, has announced the appointment of *W. S. Kidd* as vice president and general manager and *R. F. Caldwell* as secretary-treasurer. Mr. Kidd has been general manager of the company since 1938, and Mr. Caldwell has been treasurer since 1940.

◆

▶▶▶ *Philip S. Bolton* has joined the Robert Gair Company, Inc., New York City, as research director.

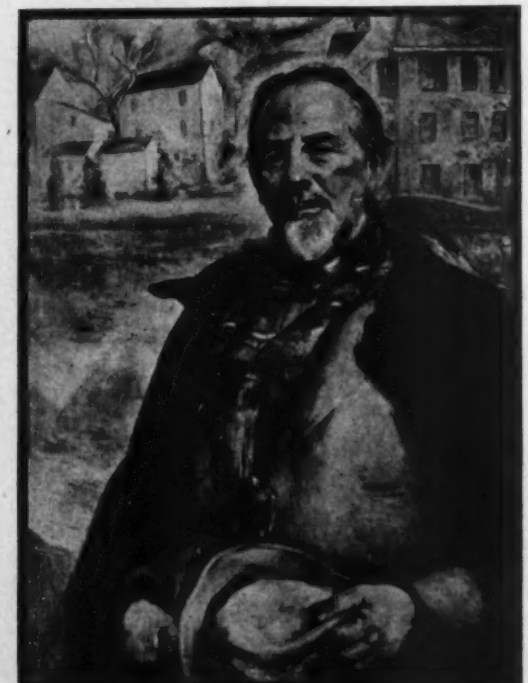
◆

COLUMBIA UNIV. GIVES DR. DORR D. OF Sc. DEGREE

The honorary degree of Doctor of Science was conferred upon John Van Nostrand Dorr, president of The Dorr Company, New York City, at the 189th Commencement exercises of Columbia University on June 1.

The citation honored Dr. Dorr as having entered, after graduation from Rutgers University, "upon a long and most useful career as engineer, inventor, and administrator in the fields of metallurgical, sanitary, and chemical engineering, with results which have been of exceptional service to the American people and their industries." It is significant, however, that his basic inventions were developed primarily for gold milling, and his initial development of new techniques and methods of liquid-solid handling was born of metallurgical problems.

Dr. Dorr has been the recipient of a number of other honorary degrees. In 1914, Rutgers University made him a Master of Engineering, and in 1927, presented to him the honorary degree of Doctor of Science. In 1940, both the South Dakota School of Mines and the Michigan College of Mining and Technology conferred upon him honorary degrees of Doctor of Engineering.



John Van Nostrand Dorr . . . from a recent portrait by Karl Anderson. A portion of the buildings of The Westport Mill, research and testing laboratories of The Dorr Company, comprise the background.

C. B. COOK ELECTED A V. P. OF ELWELL-PARKER

C. B. Cook has recently been appointed vice president in charge of advertising, sales promotion, and export sales of the Elwell-Parker Electric Company, Cleveland. He has been associated with the company for the past 28 years and has been a director since 1941.

Mr. Cook joined the company in 1914 to organize one of the first departments of sales promotion ever to be established by an industrial manufacturer under that name. He also laid the foundation for the company's export activities and has directed them continuously since that time. Previous to his work with Elwell-Paker, Mr. Cook was connected with the Allis-Chalmers Manufacturing Company and the Stevens-Duryea Company.

◆

▶▶▶ President of the American Cyanamid & Chemical Corporation, New York City, *Harry L. Derby* was re-elected president of the Manufacturing Chemists' Association at its 71st annual convention at the Waldorf-Astoria Hotel, on June 3. Other officers named were vice presidents, *George W. Merck*, president of Merck & Company, and *Charles Belknap*, president of Monsanto Chemical Company; treasurer, *J. W. McLaughlin*, of Carbide & Carbon Chemicals Corporation; and secretary, *Warren N. Watson*.

◆

W. MERLIN RETIRES FROM HOLLINGSWORTH AND VOSE COMPANY

Walter B. Merlin retired, on June 30, as vice president and manager of sales of the Hollingsworth & Whitney Company, Boston, after 60 years of association with the company. He has also resigned as a member of the executive committee of the Board of Directors, but will continue as a member of the Board.

James L. Madden, vice president, is to be manager of sales, and will be in charge of all sales offices and sales personnel, while Robert Nivison will replace Mr. Merlin on the executive committee.

At the June meeting of the Board, resolutions were passed voicing the high esteem in which Mr. Merlin is held by all of the stockholders and employees of the company, citing his active participation in the substantial

The Wahlert carboy drainer is built on scientific lines, designed to prevent accidents caused by splashing and carelessness in pouring into smaller containers.

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Large Size (3¼" to 3½") Special Neck
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INGENUITY + COURAGE + WORK
= MIRACLES

—Uncle Jake

KALAMAZOO VEGETABLE PARCHMENT CO.

Parchment — Kalamazoo — Michigan

and continued growth of the company's business over the last three score years, and wishing him a well-earned rest. At a testimonial luncheon at the Parker House in Boston given by the directors, Mr. Merlin was presented with a platinum watch and chain.

◆

ROBT. KOHS FETED ON 50TH ANNIVERSARY WITH DETROIT SULPHITE CO.

Robert F. Kohs, general superintendent, was guest of honor at a banquet given by the Detroit Sulphite Pulp & Paper Company, Detroit, in celebration of his golden anniversary with the company. He is the first employee of the company to complete 50 years of service.

Mr. Kohs started to work at Detroit Sulphite when he was only 14 years old — and the company less than 10. Starting at the bottom, he made rapid progress and was a machine tender at the early age of 19. From there on, he earned steady promotion; first to paper machine night boss, then paper machine foreman, paper mill superintendent, and in 1936, he became general manager of the plant.

The golden anniversary dinner, attended by executives and other members of the organization, was held at Dearborn Inn, Dearborn, Michigan, on June 5. Harold R. Telfer, president of Detroit Sulphite; Lawrence Hulbert, treasurer; John H. Behnke, secretary, and other associates of Mr. Kohs addressed the group. Over half of the guests who attended had been with the company for more than 20 years, 3 for over 40 years.

The Detroit Sulphite Pulp & Paper Company gave a dinner for Robert Kohs in honor of his completing 50 years of service with the company. Mr. Kohs is seated in the foreground (the gentleman wearing two carnations).

◆

▶▶▶ In March of this year, *Walter B. Morehouse* enlisted for active duty in the U. S. Naval Reserve. Effective June 15, Mr. Morehouse received an honorable discharge from the Navy and has resumed his duties as manager of the Paper Specialties Division, National Oil Products Company, Inc., Harrison, New Jersey.

◆

▶▶▶ After 30 years of service with Parsons & Whittemore, New York City, pulp and paper exporters, *Clarence W. Hatch* has resigned as secretary-treasurer. *Eli de Vries*, president, has assumed the additional office of treasurer, and *William L. Kauffman* has been elected secretary and assistant treasurer.

◆

▶▶▶ Vice president, sales division, Hinde & Dauche Paper Company, Sandusky, Ohio, *J. H. Macleed*, has been elected a member of the board of directors of the American Management Association.

◆

▶▶▶ *Flight-Lieutenant Harry Donkersley*, former employee of the Powell River Company, Powell River, British Columbia, recently received the D.F.C. and Bar for his heroism over Malta. He destroyed or damaged at least six important axis convoy ships and participated in numerous attacks on units of the Italian navy. According to the official citation, "He showed outstanding qualities of leadership and initiative."

◆

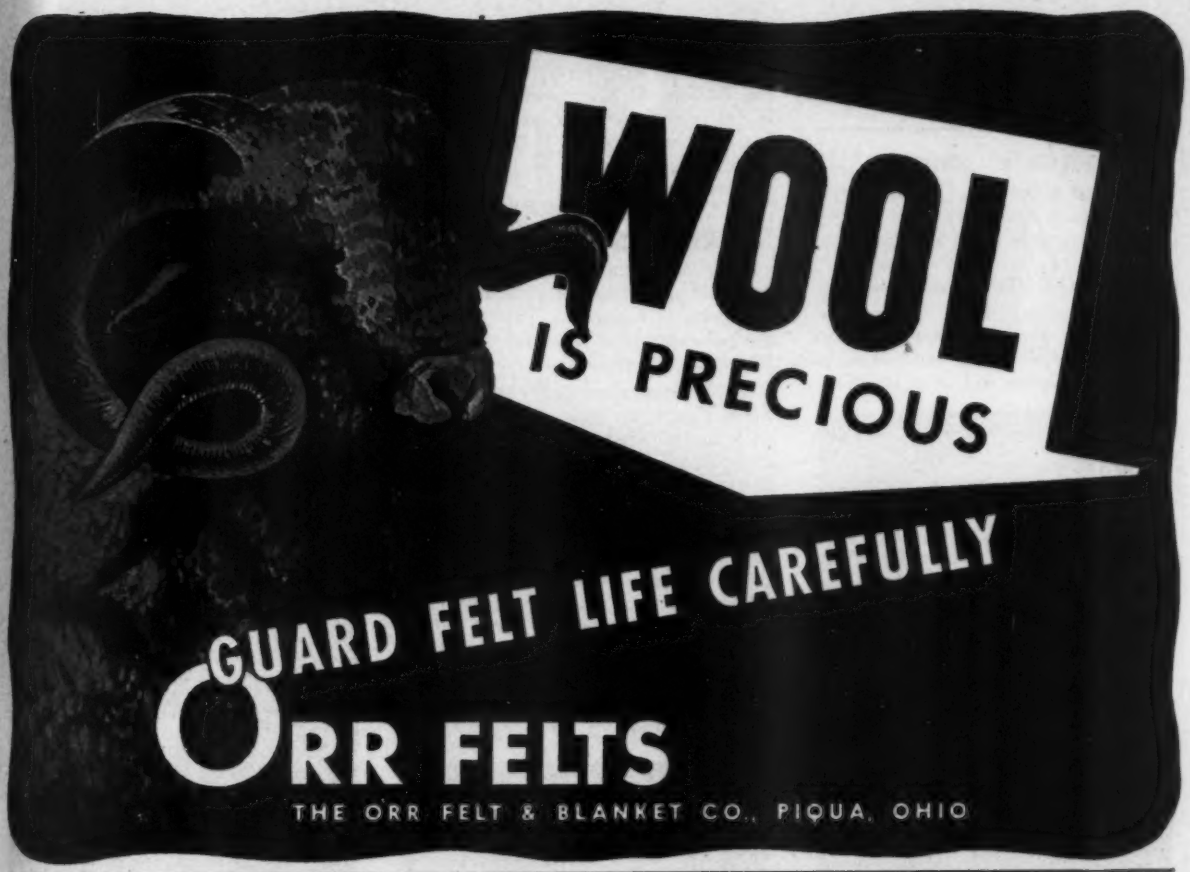
▶▶▶ A member of the engineering staff of Norma-Hoffmann Bearings Corporation, Stamford, Connecticut, for over five years, *Warren D. Anderson* has been made assistant to chief engineer of the firm.

◆

▶▶▶ The appointment of *A. E. McMaster*, of Vancouver, British Columbia, as a special assistant of the financial advisor of the Department of Munitions and Supply has been announced in Ottawa. Mr. McMaster was formerly vice president and general manager of Powell River Company, Powell River, British Columbia, and was associated with other timber and pulp enterprises in the Pacific Coast province.

◆

▶▶▶ Announcement has been made that *Keith William Max* has joined the staff of the Robert Gair Company, Inc., New York City, as a research advisory chemist. Dr. Max is a graduate of De Pauw University and received the M.S. and Ph.D. degrees from the Institute of Paper Chemistry, Appleton, Wisconsin.



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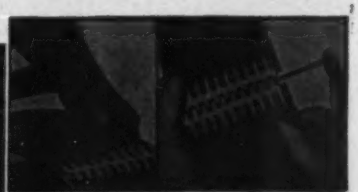

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By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

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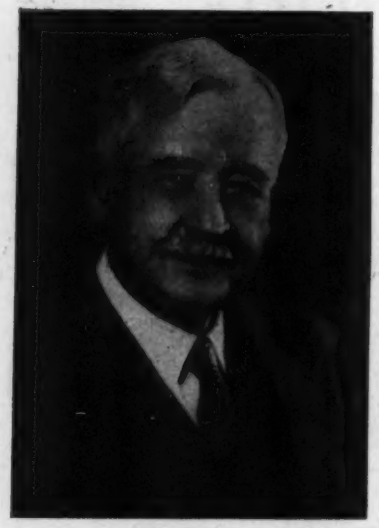
Necrology

ALFRED F. HARRIS

Chairman of the Board of the Harris-Seybold-Potter Company, Dayton, Ohio, and pioneer in the successful development of the offset lithographic press, Alfred F. Harris passed away on June 26 at the age of 83.

A watchmaker in his youth, he and his brother owned a jewelry store in New Philadelphia and later in Niles,



Alfred F. Harris

Michigan. The two were responsible for several early developments in automatic devices on printing presses, particularly the automatic feed to replace the hand feeding of paper presses.

For his development of the offset lithographic press, Mr. Harris was one of six men in the graphic arts industry to be given the "Modern Pioneer" award by the National Association of Manufacturers in celebration of the 150th anniversary of the founding of the United States patent system.

Mr. Harris is survived by his son, Alfred S. Harris, vice president of Harris-Seybold-Potter.

◆

J. E. MacMURRAY

James E. MacMurray, founder and former chairman of the board of Acme Steel Company, Chicago, passed away July 1 at Pasadena, California. He was 80 years old.

President of Acme Steel for 38 years, and then chairman of the board until his retirement several years ago, Mr. MacMurray saw the company he founded as a small enterprise develop into a prominent independent steel company. His interests in educational and religious activities were manifested in endowments made during his lifetime to MacMurray College at Jacksonville, Illinois, and to Garrett Biblical Institute at Evanston. Mr. MacMurray also served as Illinois State senator for six years. He is survived by two daughters.

◆

WILLIAM F. MOHAN

William Francis Mohan, director and first vice president of Scott Paper Company, Chester, Pennsylvania, passed away June 5 at his home in Broomall, Pennsylvania.

Born September 29, 1891, Mr. Mohan spent his early days in Boston, entering the employ of Scott Paper Company in 1914 as a salesman in that city. He became Boston district manager in 1920, divisional sales manager (the first to be appointed by the company) in 1922, and in 1924, retail divisional sales manager, covering the entire West. Two years later Mr. Mohan moved to the Chester headquarters of the company as manager of retail sales, and later became general sales manager and a member of the board of directors. In 1934, he was

William F. Mohan

appointed vice president in charge of sales, and in 1939, first vice president. For 18 months, Mr. Mohan was the active managing executive of the business while Thomas B. McCabe, president, was doing government work in Washington.

Mr. Mohan was also active in the national food field. He had served as first vice president of the Grocery Manufacturers of America, and was, at the time of his passing, director of the organization.

Mr. Mohan was 52 years old. He is survived by his widow and two daughters.

WILLIAM E. SYKES

William E. Sykes, well known authority on gears, and inventor of the Sykes continuous tooth herringbone gear and the Sykes gear generating machine, passed away in England on June 19. Mr. Sykes was formerly associated with Farrel-Birmingham Company at its Buffalo plant, but for the past 6 years has been in England operating his own plants, W. E. Sykes, Ltd.

Mr. Sykes was born and trained in England, receiving his technical education at Leeds University. After graduation, his experience in various

Wm. E. Sykes

positions covered a period of 14 years, during which he designed and supervised the manufacture of a great quantity of new machinery and equipment.

In 1923, he joined Farrel-Birmingham Company, which acquired the American rights to the Sykes process of gear generation. At the company's Buffalo plant, his entire efforts were devoted to the development of the Sykes gear machine and promoting the use of the machine and the Sykes continuous tooth herringbone gear.

Some years ago, while still in this country, Mr. Sykes organized a company in England to manufacture Sykes gear cutting equipment. This business rapidly grew into a successful enterprise, and in 1937, Mr. Sykes returned to England to devote his entire time to operating it, at the same time retaining a connection with Farrel-Birmingham as consulting engineer.

Mr. Sykes is survived by his widow.

◆

C. B. SANDERS

Charles B. Sanders, retired executive of the Union Bag and Paper Company, New York City, passed away June 6. He was 86 years old.

Mr. Sanders was born near St. Joseph, Missouri, and as a small boy went to the Pacific Coast with his father, going by covered wagon to Oregon. He became associated with the R. L. McDonald Company in St. Joseph, as a clerk, while still a young man, and continued this connection for 25 years, until 1902, when he left to go East to become associated with the Union Bag and Paper Company. He became secretary and manager of factories of Union Bag.

Surviving Mr. Sanders are his widow, a son, and a daughter.

◆

DAVID BOWEN DAVIES

David Bowen Davies, production manager for the three Northwest mills of Rayonier, Inc., passed away in Seattle, Washington, June 12.

Mr. Davies was born in Glamorganshire, Wales, in 1879, and came to this country in 1887. Before his association with Rayonier, he was superintendent of the Friend Paper Company, Miami Valley, Ohio, and Munising Paper Company, of Munising, Michigan. He was also associated with the Northern Paper Company, as manager of the pulp division, and with the Hoberg Paper Mills, Inc., Green Bay, Wisconsin, as manager. He went to the West Coast as manager of the Rainier Pulp and Paper Company in 1927, where he was a pioneer in the development of dissolving pulps for the rayon and cellophane industries.

Mr. Davies is survived by his widow and a daughter.

◆

WILLIAM J. WALLACE

Former manager of the Cornwall (Ontario) Division of Howard Smith Paper Mills, Ltd., William J. Wallace passed away recently. He was 82 years old.

Mr. Wallace went to Cornwall 60 years ago as treasurer of the old Toronto Paper Manufacturing Company, now part of Howard Smith Paper Mills. Four years later he was made resident manager, a position he held until his resignation in 1922. He remained with the company, however, serving in an advisory capacity, until 4 years ago.

◆

▶▶▶ An organizer of the Standard Paper Manufacturing Company, of Richmond, Virginia, *Granville Gray Valentine* passed away on June 2. He was a leader in Richmond's business and civic life for more than half a century. Mr. Valentine was 83 years of age.

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Convention Papers . . . Abridged

Women in War Plants

ELLEN M. DAVIES, Personnel Director
Chase Brass & Copper Co.

Many of you have employed women on certain occupations in your plants for years. Within the past 12 to 18 months, however, you have been faced with a new problem; namely, the extension of your employment policy to include women as replacements on jobs which have traditionally been considered only suitable for men. Two factors have entered into the disclosure of this new deed; one, the withdrawal of men from industry into the armed forces; the second, the unprecedented expansion of many plants.

The rapid induction of large numbers of women into war plants presents many new problems to the employer. These problems can be met through the four following steps: *preparation* for and the *recruitment, training* and *retention* of women workers. Unless these four phases in the program for the utilization of womanpower are properly organized and developed by the employer, his program is very apt to bog down somewhere along the line.

It is my belief that the most important step in placing women on men's job is to "sell" the supervisors in the plant on the program. I cannot tell each one of you how this is to be done in your plant; you know your supervisors better than anyone else could hope to. The most effective approach that can be used in most instances is that of putting the facts before these supervisors and asking them for their complete co-operation in meeting a tight situation. These facts are arrived at from your manning tables or replacement schedules, whichever you may be using, and by studying your plant expansion program.

As soon as you have enumerated your potential replacement requirements, you should review job analysis records and job specifications. I am assuming that today most organizations already have some form of job analysis and job specifications, but these should be revised with a view to discovering where women can be used. You will be surprised to find how many jobs really can be done equally well by women.

Many jobs can be taken over "as is" by women. For example in our artillery case division, women are now being used as inspectors at the New Britain and Brown and Sharpe and other machines on exactly the same job which men are doing. As the men are called, we up-grade inspectors already trained on tapping and tapering and routine gauging at the bench to these more responsible jobs at the machines. It gives the women an incentive to work hard and to do a good job and it also makes for better morale to give the more desirable jobs to those already on the payroll.

The third and fourth steps in preparation for a womanpower program are those of *breaking down the jobs* and the *setting up of job requirements* so that the principle steps in the operation are set down, and those elements unsuitable for women separated. Frequently the work area itself must be re-arranged because "women's average height is 5 in. less than that of men; women's reach is less than men's: women's fingers and hands are smaller. Women are more susceptible to varicose veins, consequently constant standing is more difficult and harmful for women than men. Adjustments may include lowering benches, installing adjustable seats, changing position of machine controls, adding guards to machinery." (U. S. Department of Labor, Women's Bureau Bulletin).

Handling material may have special hazards for women because women cannot lift as much as men since they average about half the muscular strength of men Experience shows that the average woman should not lift continuously over 25 pounds—at preferably not more than 10 lifts per hour. Employment for heavy work should be on the basis of careful physical examination. In addition to this precaution women as well as men should be taught safe methods of lifting. Heavy lifting and carrying should be done by machine power.

When job requirements for women are written up for use of the employment interviewer, special consideration should be given to the following conditions:

1) The degree of physical exertion required.

2) Knowledge of skill required, including the use of special mechanical aids.

3) Exposure to moving machinery or other operational hazards or discomforts. For example, in our own plant one of the steps in the manufacture of cartridge cases is the immersion of the cases in an acid both. The fumes coming off the bath are unendurable for some workers before they are assigned to this occupation.

4) Special consideration must be given to the amount of sitting or standing involved in the operation of the job.

5) Unusual physical requirements such as height, arm extension weight, good eyesight must also be kept constantly before the interviewer and placement officer.

Before I leave the topic of preparation there are two additional points which I should like to caution you. First, determine your wage policy for women; second, keep your union, if you have one, informed as to your womanpower program. These two points more than any other have caused employers more trouble than a dozen other elements combined. The War Labor Board has been very definite in its stand that women are to be paid wages equal to those of the men for equal skill and equal production. Of course, where there has been actual and extensive re-engineering of a job to accommodate women, it is possible and suitable to set up rates that are just and fair.

The second essential step in the program is that of *recruitment.*

The classifications of women who must be recruited fall losely into five groups.

1) Young women who each year come as new recruits to industry. These are high school graduates, business school graduates, graduates of technical and vocational schools, and those girls who for one reason or another were not able to complete their school work.

2) Married women without dependents, as well as married women (with or without dependents) whose husbands are in the Armed Forces constitute the second group. This latter group for the most part furnishes a highly desirable woman employe because of her personal interest in the rapid and successful conclusion of the War.

3) Older women who have been successful homemakers, teachers, librarians, secretaries, and who now feel that they should re-enter the industrial and technical services make up the third group. From this group some of the best supervisory and upgrading material can be selected.

4) Women from minority groups such as aliens and others are in the fourth group.

5) The fifth group is comprised of women who may be physically handicapped and partially disabled. The members of this group require very careful selection, training, and placement, but no employees will render more devoted service than these.

Industry has successfully employed interesting methods of recruitment to supplement the work done by the United States Employment Service. In communities where the manpower shortage is very acute, industrial representatives have appeared before women's clubs to speak of job opportunities and to answer questions. Some concerns have had motion pictures made of operations performed by women and have shown them to church groups, professional clubs, and other women's groups. Posters displayed in theaters, churches, and stores are also helpful.

Means must be devised in those areas of critical shortages to absorb workers on a part-time basis. Further, a sufficiently flexible in-plant program must be developed to permit the absorption of part-time women workers into our industries on a basis

Abridgments have been prepared of a large number of the papers presented at the annual convention of The American Pulp and Paper Mill Superintendents Association, which met at New York City, June 15-17, 1943. The first installment is published this month. Other installments will appear in succeeding issues.

satisfactory to the women and to industry rather than on a basis satisfactory to industry alone.

The two remaining phases of the program, namely *training* and *retention* contain elements which can be effectively used in utilization of manpower as well as womanpower. As a matter of fact, I believe that what is good personnel policy and procedure for men works equally well for women. I do not believe the problem is widely different for the two sexes except for the physical limitations of women and the extent to which their time is restricted by home ties or duties.

The principle points to keep in mind in any training program are that the work be taught *correctly from the beginning* and that quality and technique be constantly checked until the operation has been mastered.

It is obvious that time spent in preparing for the employment of women, recruiting them and training them is just so much lost motion and lost time unless you retain their services indefinitely at the end.

The consideration of new arrangements and conversion of present plant facilities in order to accommodate women workers is very important. One of the chief objections to introducing women into plants exclusively masculine is the problem which involves changing the plant lunch rooms, locker rooms, rest rooms, medical services, and general working conditions to accommodate women. Women react more positively to pleasant environment than men appear to do, and their productivity appears to improve if working conditions are good, and if there is absence of unpleasant fumes, dust, and excessive noise. This is particularly true in the cases of women who are just beginning factory work experiences, or in cases where the fatigue element is an important factor. The nervous systems of women are apparently unable to endure overexposure to conditions which have no appreciably unfavorable effect upon male employees.

The proper accommodations for women employees should be carefully worked out and arranged for *before* women are employed. The advantages of good plant sanitation and good working conditions generally are self-evident for *both men and women* employees.

Other factors which affect the retention of women on the job are health and medical care programs, safety programs, adequate transportation facilities, and *adequate protection leaving and coming to work during odd hour shifts,* and finally housing and care of children.

I had the pleasure of visiting one of the country's leading paper mills, the Crown Williamette Paper Company at Camas, Washington, recently. One of the features which interested me very much was the dormitory which had been set up for single women employees. The sleeping quarters were dormitory fashion, but attractive and comfortable. There were facilities for doing laundering and pressing, and the living and recreation rooms were large and attractively furnished. Many companies will probably have to copy this company's pattern if they hope to retain an adequate staff of women workers in critical manpower areas.

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Let me summarize in conclusion as follows:

1) A careful job inventory will disclose jobs where replacement of men will be required because of the acute need to enlarge the Armed Forces.

2) Careful and accurate job analysis and job specification will disclose jobs where women can and must be used.

3) Women workers must be selected carefully with regard to their physical, mental, and emotional capacities.

4) Absenteeism will result if women have a transportation problem which has not been met, or if care of their children has not been arranged for.

5) Unions, supervisors, and male workers must be sold on the idea of women workers before they are inducted into war jobs.

6) Training programs must be worked out to meet the emergency needs and women workers must be trained early enough so that there is a minimum loss of production.

7) Women should be paid at the same rate as men for equal production and skill.

8) Plant facilities and working conditions must be such as to attract and hold desirable women workers and should be arranged for *before* women are employed.

9) Finally, the hours of work must be so arranged that women will be able to *carry on* in war jobs *for years if need be*, and that everything necessary must be done to *sustain* the morale which is so essential if we are to *conclude our war effort in* VICTORY.

Surveys as an Aid to Moving Pulp and Paper Faster with Limited Manpower and Equipment

EDWARD SOUTHWORTH
Towmotor Corporation

One of the functions of mill operation that is causing plenty of headaches today is the handling of materials.

From your standpoint, pulp, paper, and paper products are raw materials or finished products plus scrap which again becomes raw material. To the maker of equipment for handling them, they are materials in bales, rolls, sheets, or packages weighing roughly from 400 lb. per unit to 3 tons; and in size from 30 in. x 30 in. x 18 in. to 4 ft. x 4 ft. x 6 ft. They are produced or used up or shipped out at rates of tens to hundreds of tons per day. They are stored in thousand ton lots, shipped and received in 10 to 50 ton loads and moved to and from processing operations in heavy units. They are produced and consumed by intricate automatic continuous process machinery that must be reliably and rapidly served.

Loading and unloading box cars, trucks, and even ships, stacking in warehouses, delivery to beaters and pulpers, moving products between processes in the finishing room, weighing, storing, and again loading for outbound shipment are the jobs of the handling function, each with its own individual requirements as to capacity, dimensions, and individual capability of the equipment. All the while the pace is set by vast, complex machines operated by highly trained men of great skill.

The handling job is, therefore, a challenging one to the maker of equipment, and it is vital to you. Movement of goods is commonplace when it goes smoothly. Stoppage or delay is next door to catastrophe. That, perhaps, is why the subject of materials handling assumes so great an importance when its smooth operation is interfered with.

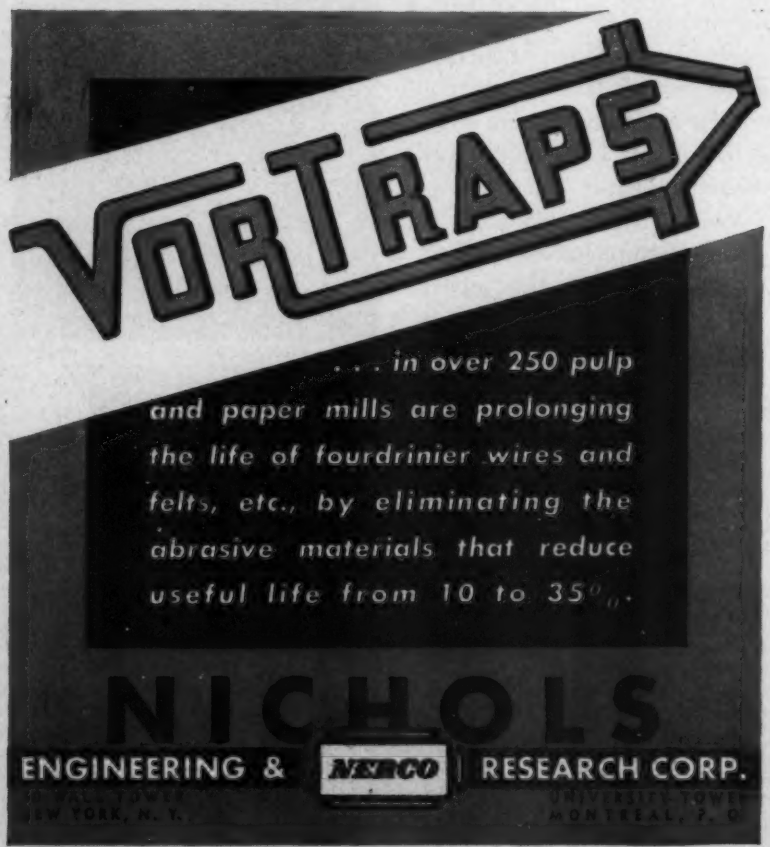
The handling of pulp in laps or bales is the first operation where the industrial truck is commonly found. Loads are placed on skids or pallets, often of special design.

Apparently, it is almost never necessary for an industrial truck to keep working full time, because we seldom find a mill where a truck is not idle for some considerable period at various times of the day. Undoubtedly, under most operating schedules it is necessary to have this extra capacity in order to allow for tie-ups and to allow time for assistance with millwright jobs and other incidental types of work. We believe, however, that in present times more careful planning of time schedules, more thorough arrangement of warehouse space, and more fully planned schedules for delivery of material from storage to beater room, or perhaps from finishing room to storage or shipping will help to utilize truck time more completely.

It can be pretty safely taken for granted that if industrial truck equipment is not in full use at all times, there must be some way to get from it the extra hours work that are needed. This does not necessarily mean that a truck which is not working full time is not paying for itself or saving manpower, but it does mean that as long as there is an additional need to save manpower, every idle period of the industrial truck or any other piece of equipment should be observed carefully with a view to finding out how that time can be applied to reducing time, manpower, and cost requirements on other jobs. Oftentimes, it may be quite simple to trade equipment back and forth between departments which have hitherto operated as quite separate units. In fact, it is generally our experience that department foremen are charged with the responsibility for scheduling the handling of materials, and perhaps it might be advisable to start with the premise that some one individual should be placed in general charge of all handling functions throughout the mill.

Equally important do we consider making sure that the most work is accomplished for every minute's use to which the truck is put. Next to that, comes the question of making sure that the truck is kept in good condition so that it will stay reliably on the job and work at full speed and minimum cost.

It may sound commonplace to say "follow the materials around," but I venture to say you will find some new things almost every trip you make. It may be simply a slight rearrangement of aisleways, or discovery that stock could be piled two-high where it is now covering a lot of floor space and producing a cramped condition. You may find that a new loading dock or perhaps another foot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added to the width of the old one will save a great deal of time in loading trucks. You may discover that the bridge plates leading into box cars are too narrow to permit trucks with big bulky loads to run in at an angle and thus save a lot of maneuvering to get the load into the end of the car. Simple repairs to floors will speed the operation of power trucks and hand operated equipment too. They increase safety to workers and to loads. Clear marking of aisleways and storage areas keep the road clear for rapid movement of goods and simplifies planning and instructions.

Maybe a ramp could be constructed to advantage, or an existing ramp could be modified slightly to increase safety and speed of operation. You will find instances where your power trucks are being used to handle relatively light loads in relatively small volumes while the travel of much bigger loads over longer distances is delayed.

The hand lift truck for pallets for example is a valuable supplement to fork truck operations, for it permits pallet loads to be moved short distances by manpower. It relieves the fork truck of the necessity for waiting to move loaded pallets out of the way at loading points or for being on hand to place them exactly at unloading points.

Repair, reconstruction, or redesign of skids and pallets and similar work carriers helps in two ways. First is the saving of time and energy for production workers by use of load carriers that can be filled at work table height or from which machines can be fed without reaching, stooping, or bending. Second is the increased ease with which properly designed racks and skids can be moved between processes by power or hand-operated units. Sometimes racks can be built for quick easy stacking, or again a slight change in dimensions of skids or pallets permits full loading and adaptability to spaces hitherto unused for temporary storage.

Where space is at a premium, it is, however, better to err on the side of having work carriers too small, because it is easier to combine a number of small loads of the same kind than it is to group several different kinds of stock on one large carrier. The minimum limit on size should be the size of the smallest stock which occurs in any considerable volume.

Where picking up, placing, and stacking operations monopolize the time of the power truck, plan to set pallet loads on 4 wheel trailers for the long hauls and let the truck tow a number at once. It can quickly unload them at the end of the run and the time of the single trip can often show a big saving over the time that would be consumed on 3 or 4 separate trips.

Urge your truck operators to be alert for improvements and to suggest ways of doing more. They may be able to point out new ways of arranging storage areas for greater accessibility, faster ways of loading or unloading cars or trucks, or faster, safer ways of loading containers and stacking them.

A materials handling tour of your mill, department by department, will show where the heavy tonnage is moved, where congestion is apt to occur and whether or not that congestion is the fault of the materials handling equipment or of some piece of production machinery that may constitute a bottleneck.

A well planned system for hand operated equipment brings the same relative advantages of full utilization of equipment and saving of manpower as does planning for the fully mechanized type. Furthermore, the knowledge such systematizing gives of production rates and hand-hour requirements for handling materials in accordance with those rates, permits complete planning for and speedy installation of a mechanical system as soon as equipment is available.

Analysis of handling operations may reveal that a few more 4 wheel trucks would reduce the number of man trips to deliver bales from storage to beaters and that ability to leave loaded 4 wheelers in the beater room would avoid re-handling of individual bales there. Likewise, more 4 wheel trucks in the finishing room would permit large load units to be easily pushed aside out of the way by packers or inspectors until the loading gang can find time to get them without interrupting other work. Generally, one lifting operation can be eliminated since it is usually as easy to build a load on a 4 wheel truck as it is to pile it on the floor.

Slight revisions of method in stacking bales and rolls with portable elevators may account for considerable saving in manpower. In this case close observation of the operation is essential, because the choice

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is between moving the materials or the equipment. You may find that time is being lost because portable elevators are moved too frequently in order to keep them close to bales being stacked or unstacked. A simple check of time required will tell whether it is better to move the bales a little farther on the average than to interrupt the work often to move the portable elevator. If the floor is good and the elevator can be moved easily, keep it close to the work. If it's hard to move because of floor or other conditions and men have to climb down from the pile to help push it, don't move it so often and plan to move the bales farther. In general, follow the principle of using man-power and man-time to move material rather than equipment.

If workmen are still seen to be struggling with loads even after floors and equipment have been put in good shape, try reducing loads by getting more skids and trucks so you can handle smaller loads. At the same time you may find you are benefiting by ability to better arrange work and storage areas.

Wet Strength Resin for Stock Addition

RALPH KUMLER
American Cyanamid & Chemical Co.

Wet strength is a term that has been much used in papermaking circles in recent months and there may be some confusion as to exactly what is meant by it. In the ordinary sense it refers to the strength of paper after soaking in water until the maximum effect of the water has been realized. It is commonly measured in terms of tensile, but may be expressed as bursting or tearing strength.

Until about a year ago, wet strength was secured by the use of glue and formaldehyde, locust bean gum or urea-formaldehyde resins. Except in certain special cases, these materials have been applied to the preformed paper web either at the size tube or other type of equipment designed for surface applications. Being water soluble, they were not retained by the fibers if added to the stock before the forming part of the paper machine. This limited the use of such materials to paper machines having the proper equipment and also placed an additional burden on the drying capacity.

More recently a new resin has been developed from melamine and formaldehyde which, when properly prepared, has such an affinity for cellulose fibers that it can be mixed with them prior to the formation of the sheet and yet be well retained when the white water is drained from the fibers. Retention averages 60 per cent to 80 per cent of the amount of resin employed depending on the percentage of white water running to waste, degree of hydration, age of the resin solution, amount of resin added, point of addition, and perhaps other factors not yet completely evaluated.

In its commercial form, the melamine resin used for the purpose is a white powder sparingly soluble in pure water but readily soluble in dilute solutions of certain acids. When added to stock dissolved in pure water, it exhibits no affinity for fibers and is mostly lost when the water is drained away. When dissolved

Printing was first practised in the American Colonies at Cambridge, Massachusetts, in 1638, by Stephen Daye. The press belonged to the Rev. Jose Glover who died during the voyage to Boston. His widow married President Dunster of Harvard College and so the press came under his control, and was called The University Press.

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in one of several dilute acids, particularly muriatic, and aged a short time (3 hours or more), retention by fibers is high. The muriatic acid remains in the water rather than with the fibers.

After preparation and aging of the acid resin solution, it is satisfactory for use for several days although it reaches its peak efficiency in about 16 hours. Eventually it becomes quite viscous and finally gels, after which it is unfit for use. None of the chemicals ordinarily employed in the manufacture of paper appear to affect the degree of wet strength produced by the resin but must be added to the stock separately. They should not be mixed directly with the resin solution.

All types of papermaking fibers respond to treatment with the acid melamine resin. The degree of hydration of the fibers, however, has an important bearing on the amount of resin retained by the fibers, and on the degree of wet strength produced by the resin retained. Much better results are obtained with well beaten fibers. Also, higher wet strength is secured if the resin is added to the stock after all mechanical work on the fibers has been completed. This usually means feeding the solution in a continuous stream at a point near the forming part of the machine such as fan pump, riffler or head box.

It is customary to use .5 per cent to 3 per cent of the resin based on the dry weight of fiber. As the amount of resin employed is increased above 3 per cent based on the dry weight of fiber, the percentage of the amount used retained rapidly declines. No increase in retention is noted if more than 5 per cent resin is used. The resin must be cured by heat after incorporation into the sheet. In many cases, the heat of the paper machine dryers is sufficient to produce a complete cure as the paper leaves the machine. In other instances, cure is complete only after several days storage of the paper. Naturally, the reaction proceeds faster in the roll or sheet pile if the initial temperature is somewhat elevated.

The acid melamine resin incorporated in the stock does more than impart wet strength. The dry bursting and tensile strengths are definitely increased and the folding endurance is improved to a marked degree. Water resistance of rosin or wax sized papers is enhanced moderately but the absorbency of waterleaf papers is scarcely affected. Accelerated aging tests made on melamine resin wet strength papers reveal that the effects of the resin are permanent under conditions of high temperature and humidity.

Careful tests for toxicity of melamine resin treated papers have been conducted by adding such papers in ground form to the food of rats and dogs. Also, dermatitis tests have been made on human subjects. Results of both tests indicate that the resin treated papers may be safely allowed to contact foodstuffs or the skin.

Melamine paper resins are being used mainly for three types of purposes; namely, papers for packaging moist materials or dry materials where the packages will be exposed to the elements, paper for printing which may be exposed to water, and papers which must not lint when moistened.

A very interesting test has just been conducted on the resistance of multiwall bags to rough handling in wet condition. About 900 bags of 8 different types of construction were filled with 50 lb. each of trisodium phosphate. Some of each type of bag were kept dry, some were submerged in water for 24 hours, and others were exposed to rain for 8 hours and then subjected to a spray of water for 24 hours. A number of bags receiving each type of treatment were dropped 5 times from a height of 11 ft. to the edge of a table 3 ft. from the floor whence they toppled to the floor. All bags that survived this treatment were loaded in a freight car, shipped a little over 200 miles, unloaded and dropped from a height of 7 ft. onto a 4 in. x 8 in. beam. The bags that came through this ordeal were reloaded in the car and shipped a little over 400 miles where the bags were dropped again from a height of 8 or 9 ft. as they were unloaded. Final data on this test have not been compiled at this writing, but results indicate that the capacity of the bags to resist such handling is roughly proportional to the number of wet strength plies included in the construction. Those having the highest wet strength treatment survived 100 per cent.

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FERRI CASCIANI, Research Department
Niagara Alkali Company

Bleach liquor, properly prepared in the presence of an excess of lime, will have a *p*H of somewhere around 11.5. This high *p*H is due, not to the hypochlorite, but rather to the small amount of available lime which is in solution in the clear liquor. Lime is soluble in 30 gram-per-liter bleach liquor to the extent of about one pound in every hundred gallons, or about 50 lb. of lime in a 5,000 gallon batch of liquor. Naturally, when less lime is present in solution, the *p*H will be lower. In practice, this can happen either when the batch is over-chlorinated in the absence of an excess of lime, or when the lime in solution is neutralized by exposure to carbon dioxide in the air during storage. When there is no longer any lime in solution, the liquor will rapidly decompose and lose its available chlorine so that it becomes worthless for bleaching.

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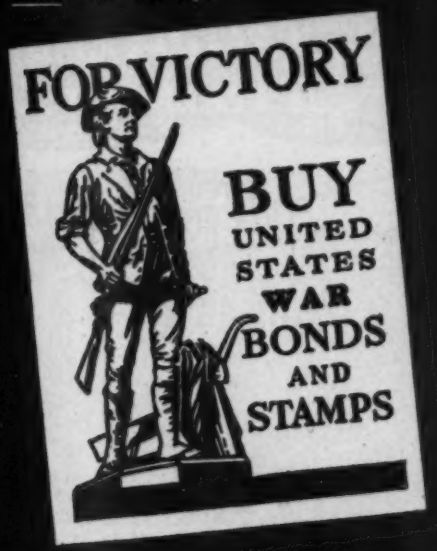

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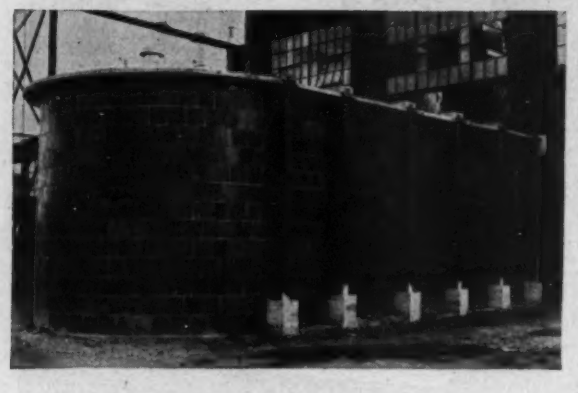

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When bleach liquor is prepared by the phenolphthalein flash endpoint—in other words, when there is only a limited amount of available lime in solution at the end of the liquor make-up operation—it is good practice, and cheap insurance, to add a bag or less of lime to the liquor as soon as the endpoint is reached, to safeguard the stability of the solution.

Now, what *p*H conditions do we have when bleach liquor is added to pulp? Let us consider first what happens when no effort is made to control or adjust the *p*H in any way. Assuming that we are using clear bleach liquor, saturated or nearly saturated with lime in solution, we will, in single-stage bleaching, start off at a *p*H of about 8.0 to 8.5. There will be, throughout the whole bleaching operation, a continual drop in *p*H, and the final *p*H will usually be between 6.0 and 7.0 although, in some cases, it may reach a value as low at 5.5. This drop in *p*H is less in semi-bleaching than in bleaching to a full white, and it is also less for easy-bleaching pulps than it is for harder pulps. In other words, the drop in *p*H depends on the amount of chemical reaction which takes place. I could explain this drop in *p*H to you by saying that it is probably due mainly to two factors:

(1) The formation of acid reaction products, such as carbon dioxide and organic acids, which are typical products of organic oxidation reactions, and

(2) The decrease in concentration of calcium hypochloride, which is an alkaline salt, and the corresponding increase in calcium chloride, which is a neutral salt.

When we come to consider multistage bleaching, we find the situation a little more complex. For example, the *p*H of bleachings is affected to a marked degree by the chemical nature of the stage just preceding the hypochlorite or bleaching stage. If the pulp were chlorinated and washed in the acid state, the *p*H in the bleaching stage would be lower than the figures I just mentioned for single-stage operation. It would be still lower if a poor job of washing were done between stages. Likewise, if the pulp, ready for bleaching, has just been given an extraction with caustic soda, the *p*H in the bleaching stage is likely to be more than just mildly influenced by how thoroughly the residual alkali is washed from the pulp between stages.

At this point I wish to emphasize the fact that, unfortunately, the *p*H which you normally get when no attempt is made to control or adjust this factor, is very seldom the most satisfactory *p*H to use.

Under present operating conditions, dictated more or less by wartime restrictions on bleaching, the brightness values to which we are bleaching are usually so low that there is little, if any harm done to the strength properties of the pulp, even under relatively crude methods of operation. Under such conditions, little if any improvement in quality can be expected from more precise *p*H control. The advantages of careful *p*H control become more and more significant as we bleach to higher brightness values. However, in many cases, it is possible, even under present operating conditions, to make some fairly simple change in the *p*H of bleaching and obtain such advantages as:

(1) A reduction in chlorine consumption.

(2) A shorter bleaching time.

(3) An improvement in one respect or another in the quality of the bleached product.

The pulp properties which can be, under certain conditions, very materially affected by the *p*H of bleaching are:

(1) The strength characteristics of the pulp,

(2) The alpha cellulose content and viscosity,

(3) The ash content, and

(4) The stability of permanence of color.

We come now to a consideration of *optimum p*H conditions and the *methods* which can be employed to achieve such conditions. There are, in the main, two separate and distinct methods of *p*H control:

(1) One may be referred to as the "high-initial-*p*H" method and consists of adjusting the *p*H only at the start by the addition to the pulp of a predetermined amount of alkali calculated to give the desired final *p*H value.

(2) The other may be called the "constant-*p*H" method and involves adjusting the initial *p*H to a desired value by the use of an alkali or acid, and then maintaining approximately this same *p*H value throughout the bleaching period by the continual controlled addition of an alkali.

The high-initial-*p*H method is the most satisfactory procedure to use in dealing with processes involving two or more stages.

In two-stage bleaching, a relatively high alkalinity at the start of the hypochlorite stage is definitely advantageous, because of the improved solubility of the chlorinated lignin under these conditions. In three-stage bleaching, in which the chlorination is followed by an alkaline extraction stage, this advantage no longer exists. In this case, inasmuch as both methods of *p*H control give about the same results, the high-initial-*p*H method is preferred because of its simplicity of operation. Naturally, the *p*H value, which will give optimum results, will vary somewhat, depending on such factors as:

(1) The type of pulp under treatment.

(2) The chlorine requirement or hardness of the pulp, and

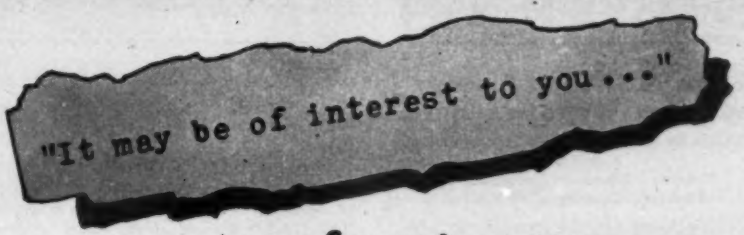
(3) The degree of brightness to which the pulp is being bleached.

In general, it may be stated that sufficient alkali should be added at the start to give a final *p*H of between 7 and 8, the most desirable figure in most cases being about 7.5. However, the exact value, which can be expected to give the best results, should be determined separately for any given set of conditions.

A practical and economical method of operating in the hypochlorite stage of multistage systems is to make the bleach liquor directly in the presence of the pulp. In this method, sufficient milk of lime is added to the pulp at the start to absorb the amount of chlorine required for bleaching and to furnish sufficient excess to maintain the proper *p*H conditions. There was a time when such a practice might have been frowned upon as a possible source of dirt. However, nowadays we have available many brands of good clean lime, satisfactory for such an application. For those who prefer to be fussy, the milk of lime can be screened through fine mesh wire to remove any objectionable particles.

The idea of keeping the *p*H practically constant during the bleaching reaction is something entirely new and is a procedure which offers considerable advantages where the single-stage bleaching method is in use. By maintaining the *p*H at a value of about 7.0 in the case of sulphite pulp and about 7.5 for kraft pulp, very definite advantages can be obtained in the way of chlorine economy, curtailed bleaching time or reduced temperature, and improved strength qualities, especially where the brightness, to which the pulp is being bleached, is rather high for a single-stage operation.

What alkali should be used for the adjustment of *p*H? So far as we have been able to determine, at least from the standpoint of quality of results, it makes little difference what alkali is used. Lime, of course, is the cheapest and, in many cases, appears to work as well as the more expensive caustic soda. It is sometimes more convenient to use caustic soda, and, because of the small amount usually required, the additional cost is not much of a deterring factor. There is evidence that, in certain applications, caustic soda gives results superior to those obtained with lime. Recently, many claims have been made for the use of sodium metasilicate. Our own experience has been that, at least within the scope of our recent laboratory investigations, metasilicate has failed to show any material advantage over caustic soda. In



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addition, to obtain a given result, metasilicate appeared to be more costly than the other alkalis.

What means should be used for the measurement of *p*H in the mill? In the past, phenolphthalein indicator has been used for this purpose and even today it is relied upon to a considerable extent in many mills. Under normal conditions, phenolphthalein will give a pink color reaction down to a *p*H of about 8.3. Recent investigations in our laboratory have shown that, when used in connection with the bleaching of pulp, this minimum *p*H at which a pink reaction will result, may be anywhere from about 6.75 to 8.0, depending on quite a number of factors. It is our firm belief that, if satisfactory *p*H conditions are to be maintained, something much more accurate and dependable than phenolphthalein indicator must be used. The only tool which has proved satisfactory for this purpose is the potentiometric *p*H meter employing a glass electrode.

It is apparent to all of us that wartime restrictions on bleaching have wrought many changes in bleaching technique. Low brightness ceilings have eliminated some problems and created others. We are seldom worried now about preservation of the strength properties of the pulp. We have found that the bleaching time is shorter and, consequently, we can either get out more production or operate at a lower temperature, thereby saving steam. On the other hand, we have learned that, at the lower brightness values, dirt becomes a real problem. Many of us have never before realized to what extent we have been dependent on bleaching to clean up our pulp.

In the case of sulphite pulp, we have also found that it still takes quite a bit of chlorine to bring a bout a fairly small increase in brightness over that of the unbleached pulp. Consequently, some of us have found it expedient to mix more fully-bleached pulp with unbleached pulp to obtain the desired semibleached color.

Many of us are also finding out that a multistage bleaching plant can become somewhat of a white elephant when high brightnesses are no longer desired. In fact, it has undoubtedly been found advisable in some mills to by-pass the purification stages to bleach in a single-stage operation in order to minimize the trouble with dirt.

I believe that, in the future, pulp bleaching developments will probably be characterized by a more intelligent and scientific approach to the proper control of process variables. The result will be the discovery that efficient bleaching plants do not necessarily need to be complicated and unwieldy, and that, as a rule, good results can be produced in well-designed bleaching installations employing no more than two or three stages of treatment.

Use of Melamine Resins for Better Wet Strength

CHARLES S. MAXWELL, Paper Chemical Section
Stamford Research Laboratories, American Cyanamid Company

The property of "wet strength" in paper has been known for some time. It has been common knowledge that several materials, such as glue-formaldehyde and regenerated cellulose (viscose) give a toughening effect to paper, even when the paper is completely water-saturated.

The discovery that urea-formaldehyde resins [the term "resin" is used locally to include all urea-formaldehyde (or melamine-formaldehyde) condensate products from monomers to polymerized products] could be used for this purpose gave new impetus to the wet strength treatment of paper. Water-soluble urea-formaldehyde resins were found to impart excellent wet strength both to rosin-sized and waterleaf paper, when the paper web was impregnated with the resin solution and the resin subsequently cured on the paper machine dryers.

Until very recently, this so-called tub application was the most satisfactory method of applying wet strength resins to paper. This limited the use of the resins to those mills which had size presses or some other means of surface application. A more general method of application was needed.

Innumerable efforts have been made to apply wet strength material to the paper stock *before* the paper is formed on the wire, and several patents have been issued on specific applications of this nature. However, none of these has been entirely satisfactory.

One big problem in connection with beater application (beater application in this article is intended to include treatment of the stock, not only in the beater engine, but also at any point before the paper web is formed) is that of retention.

Unpolymerized urea-formaldehyde resins are water-soluble, and to render them insoluble for possible use in beater application, it is necessary to polymerize them. Several patented wet strength processes are based on this controlled polymerization. However, the fact that a resin has been rendered water-insoluble is not alone enough to make it a satisfactory wet strength resin.

Recently it has been found that melamine-aldehyde resins will impart wet strength properties to paper. Melamine resins are relatively new, but already they are providing, among other things, better finishes for automobile bodies and new plastics unsurpassed in electrical resistance. Their high durability and other desirable properties more than compensate for their higher unit cost.

Melamine is basically a triazine consisting of a six-membered ring of alternate carbon and nitrogen atoms. Each carbon atom is also attached to an NH_2 group, and it is these groups that react with formaldehyde.

Melamine resins, after treatment with acid under carefully controlled conditions have unexpected new properties which differ fundamentally from the urea resins. When this acid-treated resin is allowed to age, polymerization takes place and a blue haze develops, indicating the presence of

This is the fifth installment of abridgments of papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, held in New York City, February 15-18, 1943. Monthly installments of these abridgments will appear in succeeding issues.

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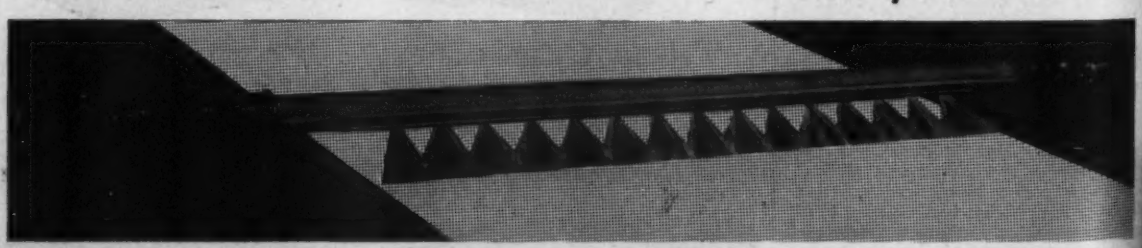

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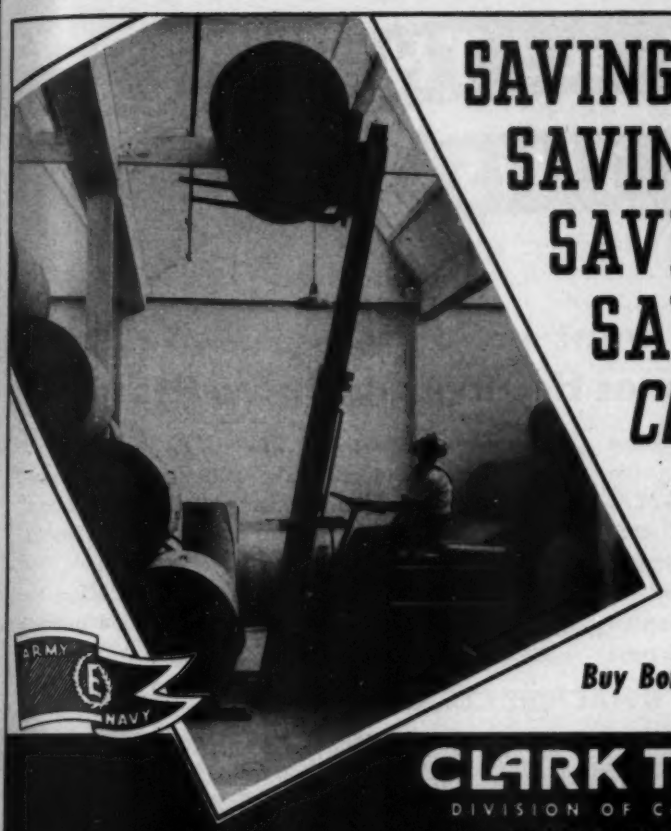

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resin particles in the colloidal range. One remarkable property of these colloidal particles is that they have a positive charge, as determined by cataphoretic methods. Cellulose fibers are considered to be negatively charged, so the addition of the positively charged, colloidal resin should result in a mutual attraction. Apparently this is exactly what happens.

When the resin colloid is mixed with paper stock, it almost immediately attaches itself to the fiber and forms such a close bond it cannot be washed free. Complete retention of the resin by the fiber is not achieved; but up to about 5 per cent resin solids based on dry fiber, the retention plotted against the resin added is almost linear. However, above 5 per cent a sharp break occurs, and practically no additional resin is held by the fibers, even though the amount of added resin is increased to 50 per cent of the dry fiber weight.

Cellulose fibers treated with 3 per cent of this resin colloid retained between 60 and 80 per cent of the added resin. The wet strength, as measured by the wet tensile strength after soaking 16 hours, increased from almost nothing to 50 or 60 per cent of the original dry strength. Wet bursting strength increased in about the same proportion, while the wet rub resistance (double strokes to wear through the paper) rose from an average of ten, to several thousand. These effects should result from any satisfactory wet strength treatment. However, this specific beater treatment was found to give, in addition, unexpected valuable properties.

The dry burst and dry tensile values were increased about 15 per cent. The folding endurance, instead of dropping, as is the case when wet strength is obtained by tub treatment, was materially increased, sometimes as much as several hundred per cent.

The aging properties of this beater-treated paper were also found to be remarkable. In working with wet strength papers containing urea-formaldehyde, it had been noted that the wet strength effect decreased on aging, and that this drop was particularly rapid under storage conditions of high temperature and humidity. However, the melamine resin maintains its effectiveness even under the storage conditions.

The melamine resin (Paper Resin 605) as received by the mill is a finely pulverized white powder. The general procedure is to dissolve the dry resin in a mixture of warm water and hydrochloric acid, and then dilute with cold water to 12 per cent resin solids. This makes one gallon of solution equivalent to one pound of dry resin.

This solution is allowed to age for at least 12 hours, after which time it is ready to be used. In this condition, the solution will normally keep several days, but if kept too long will gel and become unfit for use.

The most satisfactory point of application for the resin solution is after all beating and other refining have been completed, and a point often selected for this addition is at the fan pump. The treated paper coming off the machine will have appreciable wet strength, and this will normally improve after aging a few days.

As far as is known, any of the usual papermaking sizing materials and fillers may be used with this treatment. No deleterious effects have been found, and in fact some combinations may give additional beneficial effects. Some of the materials used with the beater resin thus far have been resin size, wax size, alum, starch, glue, and clay and other fillers. When both resin size and the acid resin are used in a stock, a definite increase in water resistance results. If no size is used, the presence of the beater resin does not affect the water penetration, although slightly less water may be absorbed.

Some interesting results have been noted in laboratory experiments in which various types of dyes were incorporated with the resin-treated stock. It was found that with some dyes changes in shade, strength, and fastness properties occur. For example, the fastness to bleeding of many dyes in hot or cold water was definitely improved. In some instances, however, decreased fastness to light was observed, and apparently the decrease in light fastness was proportional to the amount of resin present. Obviously these implications will be of great interest to manufacturers of many grades of paper. An extended investigation is in progress, results of which will be made available as soon as possible. (Most of the work on dyes is being carried out by the Heller & Merz Department, Calco Chemical Division of the American Cyanamid Company, at Bound Brook, N. J.)

The possible uses of wet strength paper are almost infinite, particularly when dry strength and fold endurance are also increased, as they are when the beater method is used. First and foremost are the wartime demands for products such as camouflage strips and netting, paper bags that must substitute for burlap and shipping containers that will not fall apart when saturated with water.

Other applications for the beater resin range from the production of blueprint stock and strong papers for wrapping vegetables and meat, to towel stocks consisting mainly of groundwood. The additional dry strength obtained permits the use of lighter weight paper in many instances, thus releasing pulp for other uses, and partially offsetting the cost of the wet strength treatment.

Commercial applications of the new beater wet strength process have developed so rapidly that the fundamental investigation of the mechanism involved is still in progress. As the work continues, it is expected that additional basic data will lead to an even wider scope of commercial usage, possibly even in fields other than papermaking.

Acknowledgment—The work reported in this paper is the result of the cooperative efforts of many individuals, and the author wishes to acknowledge the valuable assistance of several groups at the American Cyanamid Company's Stamford Research Laboratories and at the laboratories of the Calco Chemical Division at Bound Brook, New Jersey.

Refractory Selection and Maintenance Problems

DAVE W. WUERTHELE
A. P. Green Fire Brick Co.

To practically all pulp and paper manufacturers, the most important cost figures for refractory maintenance are those for maintaining the linings in the steam generating plants and the rotary burners used for processing the materials for manufacturing their products. Steam for manufacturing purposes is universal in all paper plants, and boiler refractory maintenance is a common and oft-repeated repair problem.

The ultimate life of fire brick linings is, of course, a function of the boilers in which they are installed. Factors to be considered are: kind of fuel, method of firing, B.t.u. release, type of boiler, cycle of heating. All of these functions are interrelated to each other, and they must all be taken into account in order to determine the correct type of refractory to best withstand all of the conditions encountered.

Since the paper industry, due to its widespread geographic location, can be expected to have boilers fired with anything from bagasse to natural gas, the first consideration should be the type of fuel and the impurities contained therein.

At elevated temperatures the fuel impurities frequently act as violent fluxes. These fluxes, through chemical reaction, have the effect of reducing the fusion point of the brick, thereby making it easy prey to failure because of its reduced softening point. This causes lower structural strength, greatly increased vitrification, less resistance to erosion and abrasion, and highly increased spalling.

Six Months versus Twenty Years Service *from Manganese Steel Chain*

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One of the engineers at our Oakland foundry worked out the riveted cast center-link and sidebar design shown in picture A-228, with the same general dimensions as the forged coil chain. The manganese steel chain shown in View A-227 was installed at the saw mill where it has been in service for over twenty years, latterly in log-haul-up duty. How much longer it will last is more than we would venture to predict.

The chain design as much as the durability of "the toughest steel known" figures in the twenty year record, having provided a much larger bearing area than that of the chain which it replaced. This, added to the tough stress resistance and the work-hardening property of austenitic manganese steel, accounts for the phenomenal performance.

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The method of firing is important as for example oil firing versus coal firing. In the case of coal firing, there is a heavy bed of fuel on the grate which necessitates a period of time to bring the boiler to temperature and by the same token a period of time to cool. As a result, this reservoir of heat means that the fire-brick linings are brought up to temperature slowly and naturally allowed to cool slowly. This cycle is beneficial for the life of refractories. In the case of oil, gas, shavings, or any other quick-flashing fuel, the rate of heating on the face of the refractories is faster than the rate of heat transmission through the body of the refractory. As a result, the unequal expansion strains set up are severe. When taking the boiler off the line for cooling, strains are renewed and the heat liberation of the face of the brick is much more rapid than the liberation of heat of the balance of the wall. This causes severe cracking or spalling.

The British thermal unit release per cubic foot in a boiler is important, as it is a direct cause of fusing or melting of brick, when the B.t.u. release is too great for the type of brick employed. There are certain rules of thumb sometimes used in determining the correct refractory to be used. In this case, however, there are so many variables, it is not safe to use any hit-or-miss method.

The many types of boilers and the difference of firebox design employed, together with the steaming characteristics must be taken into account. Horizontal return tube boilers will, by their very design, cause certain types of refractory failures that will not be encountered in water tube boilers for instance. As in any type of equipment different designs can be expected to show trouble in certain well-defined places. The nature and cause of trouble will determine the type of refractory to be used in combating difficulties.

The cycle of a boiler and its steam requirements are of vast interest to the investigator of refractory ills. When the demands of a boiler are such that the steam output, and thus the fires, remain reasonably constant day in and day out, the failures caused by rapidly fluctuating temperatures are of course not encountered. However, when the load of a boiler varies from day to day or from hour to hour the fire-box temperatures may raise and lower several hundred degrees at frequent intervals. This imposes a severe strain on the refractories due to unequal expansion and contraction and the result after a time is failure from spalling. In addition, the constant movement of the walls causes eventual looseness, shearing of the headers, and bulging. This means that often repairs are necessary, not necessarily because of brick failure but because of structural failure. This is especially true of boilers set in battery and fired alternately. It is also common for battery-set boilers to show an earlier failure of the battery wall due to the fact that radiation is much faster through the outside wall than the battery wall. At this point it might be interesting to mention that the same brick will show entirely different characteristics when entirely surrounded by heat as when set in a wall where heat radiation loss is fairly rapid.

Since there is no such thing as a cure-all in fire brick, it then becomes necessary to select the type of refractory which will best withstand the greatest combination of the most destructive forces.

To best combat fluxing and its attendant evils a refractory should be chosen which is free enough, in itself, of chemical impurities to retard reaction with the constituents of the ash of the fuel. It should also be sufficiently dense in structure to resist penetration of various fuel slags.

At times this slag action is the most destructive factor to be considered and therefore it is best to have a refractory which will be least affected by the chemical constituents of the slag. If a refractory low in impurities is chosen, it will take a relatively higher amount of fuel impurities to form a given percentage of fluxing, such as would be the case in the formation of sodium aluminum silicate or the mineral nephelite.

In the case of the porous brick, the slag could be considered to have penetrated into the pores of the brick in the molten state when it might freeze, but still be attached to a larger source of the slag in the fuel bed. This when cooled would form a clinker slag which would call for the erection of the slice bar. As the slice bar was used on the slag, it would naturally pull away parts of the refractory to which it has been attached by freezing and thus the wall could literally be torn away. This calls for a dense refractory to resist the penetration of the slag and one which is strong and will withstand this abrasion of the slice bar.

The method of firing a boiler is a source of refractory problems also.

In the case of solid fuels, there is a heat reservoir or source of latent heat which is far easier on refractories than gaseous fuels. The limitations of this type of fuel are that it takes longer for elevated temperatures to be reached, when the boiler is put on the line and inversely longer for the boiler to cool. This enables the refractories to go through their expansion and contraction stages or to put it another way, their stages of physical readjustment so slowly as to greatly minimize the strains of different growths in one solid piece of brick.

In the case of the nonsolid fuels, the rate of heat absorption is extremely rapid since the heat of the burner is transmitted directly to the fire brick wall immediately. The medium of heating a boiler is by radiation and convection; therefore, the more rapidly the walls become hot, the more rapidly the heat is transmitted to the tubes, drums, or other black-body area. As a result, the heating is as rapid as the brick will absorb it; and the brick cools as rapidly as possible when the burner is turned off, because there is nothing to retard the rate of heat loss. This means that the inner or furnace surface of the brick is heated much faster than the heat can be transmitted through the brick and as a result the surface has a tendency to expand more than the body of refractory behind it. On the cooling cycle, the surface of the brick loses its heat faster than the mass behind it and tends to contract before the rest of the refractory. In both cases, the strain of unequal expansion or contraction is often greater than the bond strength of the brick and severe spalling is encoun-

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THESE are needed now more than barking drums, screens, chippers, etc. Throughout our large plant the scene is similar to the above picture. Everywhere there are parts for some implement of war—and we're glad we can use our plant facilities to make them.

Until we beat the Axis, the scene above will be the every day appearance of our plant. After that we'll be better able to meet your needs for new machinery and parts.

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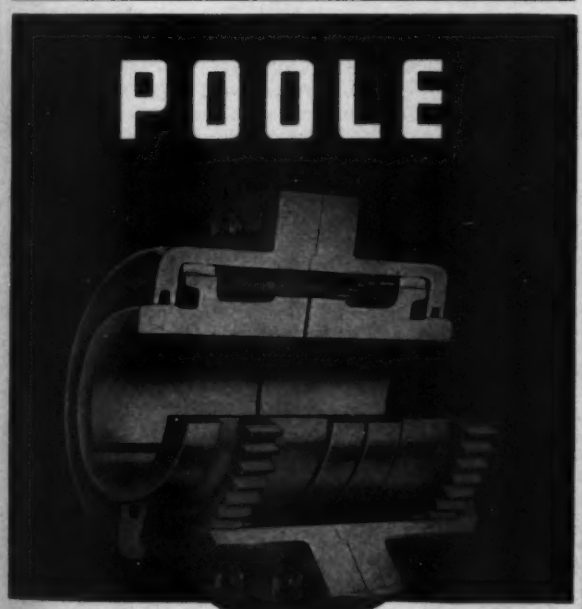

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NOT just in a figurative sense—but in a practical, money-saving, production-boosting way—the Johnson Rotary Pressure Joint *Keeps 'Em Rolling* in the paper industry.

It keeps rolls rolling because it keeps them free from all the troubles of the old stuffing box steam fits. No more packing, or repacking. No more oiling. No more adjusting. No more life-shortening wear or loss of efficiency from misalignment. No more time wasted while machines are shut down to service or replace steam fits. No more worry about syphon drainage pipes rubbing on dryer journals.

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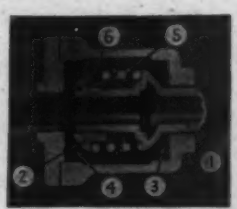
Nipple (1) fastened to roll. Sliding collar (2), keyed (6) to nipple. Carbon graphite seal ring (3) and bearing ring (4), which eliminate packing and oiling. Spring (5) is for initial seating only; in operation joint is pressure-sealed.



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tered. Obviously there is practically no problem from this score with solid fuel, but it is a major problem with gaseous or liquid fuels. It then is indicated that a brick having excellent bond strength and maximum resistance to spalling should be chosen. Above all, the brick should be chosen which has the absolute minimum of expansion or contraction. Not only is the spalling factor important, but the constant movement of the walls due to excessive expansion and contraction is such as to cause early failure due to sheared header and loosening of the structure.

One of the most frequent misapplications of refractories takes place when the B.t.u. release of a boiler is not correctly considered. First, consideration should be given to the B.t.u. release at its peak during boiler operation, not its average. There are many angles to study in B.t.u. release which are not immediately apparent. There is the question of black-body surface and its relation to B.t.u. release both in area and the relation of such area to the radiation surfaces of the refractory.

For instance, a refractory used in a boiler which has a high, narrow fire box with the black-body area high above the grates or burners will have a much shorter life than the same refractory used in a fire box which is much lower and wider, both boilers having, of course, the same B.t.u. release.

If the boiler design is such that a high narrow setting is the problem, then a refractory must be used which has an extremely high softening point and maximum resistance to elevated temperatures regardless of fuel used.

To correct the severity imposed on refractories by rapidly fluctuating load conditions, a refractory must be selected which can withstand successfully the normal causes of failure which are greatly accelerated by the varied loads.

The selection of refractories for use in various types of kilns is no less important than for other operations.

Necessary properties of linings in these uses are high refractories, close texture, good resistance to penetration by slags and fluxes, minimum tendency to fail through thermal spalling and pinching, mechanical strength at elevated temperatures and resistance to abrasion. Conditions in handling different materials and in different zones of kilns require greater emphasis on individual properties. In the cold zone, where wet sludge may be charged into a rotary kiln, close texture and resistance to penetration are of primary importance. On the other hand, in the burning zone high refractoriness is the first consideration. In the hot zone, which is intermediate between the cold zone and the burning zone, the required refractory properties of both these zones must be balanced. At the discharge end resistance to spalling and abrasion require first consideration. Special attention is required when handling materials which act as fluxes on fire brick linings.

From the foregoing it must be apparent that no one refractory can combat all of the conditions which may be imposed. Therefore, it appears that a careful analysis should be made to determine what are the principal causes of failure and those which occur most often. After having determined this, the selection of refractory or several types of refractories to be used will be dictated by the inherent characteristics of these refractories to successfully meet the conditions.

A note of caution should be mentioned here as very frequently the causes of failure cannot completely be determined by a surface inspection. It is often necessary to examine the structure of a refractory to fully analyze the cause of failure. Advantage should be taken of the services of a thoroughly trained refractory engineer, because the manufacturing and application of refractories is a highly specialized engineering.

New Derivatives of Lignin

E. BRUCE BROOKBANK,[1] F. E. BRAUNS,[2] H. F. LEWIS,[2] and M. A. BUCHANAN[2]

As one phase of a broad program dealing with the chemical properties and uses of lignin derivatives, in particular those of hardwood soda lignin known as Meadol, an intensive study has been made of the esters of lignin with aliphatic acids.

The product Meadol represents an isolated lignin prepared from hardwood soda black liquor. The black liquor is first evaporated to a specific gravity of 1.1, which corresponds to a solid content of 19-20 per cent; of this, some 60 per cent is organic matter and the remainder is soda ash. The lignin is precipitated from the solution by passing carbon dioxide (from flue gas) through the solution until a *p*H of 8.5-8.6 is reached. The lignin separates in the form of an extremely fine precipitate which is coagulated on heating to 90 C., followed immediately by cooling to 40 C. The lignin thus precipitated is filtered, washed with water, with dilute sulfuric acid, and again with water, and is dried on a double-drum dryer. The dried, powdered product (sold as Meadol) has an ash content of 0.5 per cent and a moisture content of 2-4 per cent. Its methoxyl content is 21.5 per cent, which agrees well with values usually given for hardwood lignins. The carbon content of 64.4 per cent and hydrogen content of 5.9 per cent are within the range generally ascribed to these products. Meadol is soluble in pyridine, partly soluble in dioxane, acetone, and alcohol, and insoluble or, at best, only very slightly soluble in ether and petroleum ether.

In general, these lignin esters are prepared by the same method; this involves the dropwise addition of 5.5 moles of the acid chloride to a dry pyridine solution of 1 mole of Meadol (unit molecular weight of 860) previously dried in a vacuum desiccator over sodium hydroxide. The crude ester can be precipitated by pouring the reaction mixture into ice water with vigorous stirring. Pyridine can be recovered in large measure. The impure precipitate contains some pyridine and pyridine hydrochloride, as well as free fatty acid, and it is necessary to remove these to recover the ester in an approximately pure condition. The method followed is specific for the particular ester and depends upon the nature both of the ester and of the fatty acid.

The most interesting physical character-

(1) Development engineer, The Mead Corporation; (2) and (3) research associates, The Institute of Paper Chemistry.

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istic of these new lignin compounds is that of solubility. Without going into the matter in too much detail, the following statement may be made regarding the effect of a variation in acid groups in the solubility behavior of the lignin esters. Esters of the acids through the C_5 acid (valeric acid) are soluble to the extent of less than 10 per cent in methyl or ethyl alcohol; they are soluble to the extent of 50 per cent or more in acetone, chloroform, dioxane, benzene, or ethyl acetate; they are almost insoluble in petroleum ether, and the acetate and propionate are insoluble in ethyl ether. As the molecular weight of the fatty acid increases beyond this point, the solubilities in the two alcohols decrease but increase considerably in ethyl ether. The higher esters (above the C_{13} acid) are readily soluble in all the solvents listed, with the exception of the alcohols, and the palmitate and stearate even dissolve in these solvents to somewhat less than 10 per cent. These lignin derivatives are readily soluble even in petroleum solvents (such as petroleum ether) and in ethyl ether and benzene.

Esters of the dibasic acids prove to be much less soluble in all solvents than were the esters of the monobasic acids.

The melting points of the lignin esters of the monobasic acids are highest for the esters of low molecular weight and steadily decrease to a low of about 65 C. for the lauroyl and tridecanoyl derivatives. Melting points of esters of the dibasic acids are higher than those of monobasic acids of corresponding carbon content.

A study of the industrial applications of the Meadol esters has just been initiated. It has been found that Meadol stearate is an excellent mold lubricant for woody plastics such as redwood, hydrolyzed wood, and the like. Because this product is also soluble in drying and semidrying oils, it may be successfully incorporated in ink and paint formulations.

Molding compounds in which various Meadol esters have been substituted for Meadol have shown a reduction in water absorption of the finished molded articles, especially when the higher esters are used.

Other possible applications of the various esters are suggested by their solubility and melting point behavior. By selection of the proper ester it is now possible to use Meadol in many applications where it could not be used otherwise. Studies of these uses are currently under way.

A Further Comparison of Sodium- and Calcium-Base Sulphite Acids II

The Effect of Decreasing the Time to Maximum Temperature with a Corresponding Reduction in Total Cooking Time

M. O. SCHUR[1] and E. G. INGALLS[2]

It has been reported by Schur and Baker (Schur, M. O., and Baker, R. E. *Paper Trade J.* 112, No. 20; 38-45 May 15, 1941; *Tech. Assoc. Papers* 24: 405-412 1941; Schur, M. O., and Baker, R. E. *Paper Trade J.* 115, No. 12: 33-40 Sept. 17, 1942; *Tech. Assoc. Papers* 25: 453-460 June 1942) that with cooking acids containing 1.0 per cent combined SO_2 and 5.0 per cent free SO_2, a given degree of cooking, as measured by the permanganate number of the unbleached pulp, was realized in a shorter cooking time with sodium-base acid than with calcium-base acid, when a mixture of red spruce and balsam fir was digested according to given time-temperature schedules and under the same maximum digester pressure. The temperature schedules followed were typical of commercial practice in the manufacture of a strong pulp of medium bleachability in a mill using a cold-acid system. These studies have now been extended to include cooks in which the time to maximum temperature was reduced systematically from about 9 hours to 2 hours, with the maximum temperature at 290 Fahr. (143 C.) in every case. A maximum pressure of 85 psi (gauge) was maintained until 1½ hours before the blow, when the digester pressure was relieved gradually to 58 psi for the blow.

The wood digested was a mixture of 70 per cent red spruce and 30 per cent balsam fir, on a moisture-free basis. Chips were prepared from each species separately with a three-blade rotary chipper of commercial design. After the chips had been tested for moisture content, the two species were mixed in the stated proportions. The logs as chipped contained between 40 and 50 per cent moisture.

In every cook the weight of wood, on a moisture-free basis, was 4,500 grams. Acid of the proper composition was added to give a total weight of combined SO_2 equal to 207 grams.

The stationary digester described by Koon and Keepers (Koon, C. M., and Keepers, C. H. *Paper Trade J.* 112, No. 1: 34-5 Jan. 2, 1941) and the methods of testing previously described by Schur and Baker (Schur, M. O., and Baker, R. E. *Paper Trade J.* 112, No. 20: 38-45 May 15, 1941; *Tech. Assoc. Papers* 24: 405-412 1941) were used.

With each type of cooking acid, a straight-line relationship was observed between the total cooking time required to attain a pulp of permanganate number 12.0 and the time required to reach the maximum temperature.

In no case was there evidence of "burning" of the chips, even when the total cooking time was only 4½ hours and the time to maximum temperature was as low as 1½ hours. This observation may come as a surprise to some, but it is undoubtedly to be attributed mainly to the excellent control and uniformity of temperature and composition of cooking liquor throughout the charge in the laboratory digesters.

The previously observed faster pulping action of sodium-base cooking liquor as compared with calcium-base liquor, each containing initially 5.0 per cent free and 1.0 per cent combined SO_2, has been confirmed. In addition, it has been noted that the difference in rates of pulping decreases only slightly as the time to reach maximum temperature is reduced. However, the extent of fiber liberation, as judged by freedom from screenings, decreased much more rapidly in the case of the cooks with calcium-base liquor as the time to maximum temperature was decreased.

It is interesting to note that the maximum pressure of 85 psi employed in the present study was reached at a lower temperature, approximately a constant difference of 6 degrees Fahr., with the calcium-base cooking liquor than with the sodium-base liquor, regardless of the temperature schedule used. The maximum pressure was reached in a shorter time with the calcium-base liquor than with the sodium-base liquor, but the difference was much greater when the time to maximum temperature was 9 hours than when it was 2 hours.

(1) Director of research and development, and (2) research chemist, Brown Company.

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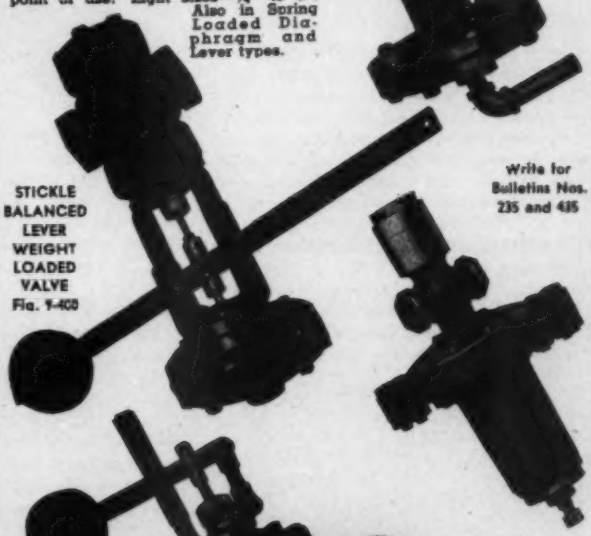
STICKLE STANDARD REGULATING VALVE Fig. 208

• A single-seated, balanced valve for dead end service. Permits a constant reduced pressure to be maintained against a variable supply pressure. Internal parts, including valve and seat, interchangeable. May be repaired at point of use. Eight sizes—¾" to 4". Also in Spring Loaded Diaphragm and Lever types.



STICKLE BALANCED LEVER WEIGHT LOADED VALVE Fig. 1-400

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AUXILIARY PILOT-OPERATED LEVER VALVE Fig. No. 220

• Supplies close regulation and control under various conditions of initial and reduced pressure requirements. Adapted for bleeder turbine service. Smaller sizes used where live steam make-up is required and an accurate reduced pressure is necessary. Supplied in either 200—or 400—Series in lever type or combination.

STICKLE SPRING BALANCED VALVE Fig. No. 205

• Three sizes—½", ¾" and 1". Renewable valve and seat. Diaphragm case detachable. Valve can be reground without removing valve body from line. Ideal for small water line reductions and individual installations on unit heaters and other small equipment.

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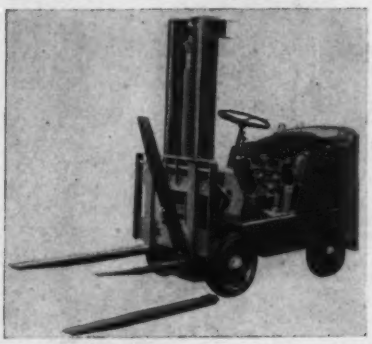
NEW EQUIPMENT AND SUPPLIES

Fork Extension Adaptor for Lift Trucks

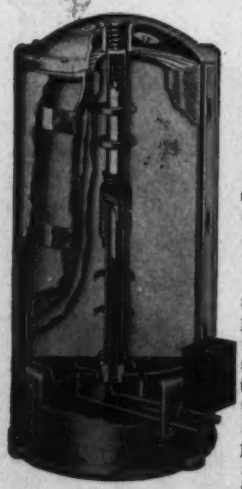
Towmotor Corp., Cleveland, O., has announced a fork extension adaptor for application to fork-type lift trucks. Fork lengths can be extended safely as much as 24 in. by the use of the adaptor, thus making it unnecessary for skids or pallets



to fall within a certain size range to be accommodated efficiently by the same truck. To attach an adaptor, it is necessary to do only three things—first, hold it vertically with eye downward at forward end of fork; second, insert eye over fork and slide back to bend; third, lower. The adaptor automatically locks in position.

Continuous Oil Purifier

Honan-Crane Corp., Lebanon, Ind., has announced an improved design of its oil purifying unit. In operation, dirty oil enters through the bottom of the purifier and then rises within it to surround a metal basket that encloses fill material known as *Cranite*. The fill is held in a replaceable cloth bag and acts to filter out both sludge and grit and to absorb acid. The clean oil passes through screened opening in central tube, then rises inside tube to inner tube at top, and finally moves down inner tube to delivery at bottom. For average operation, the recommended oil temperature is 140 to 170 Fahr.

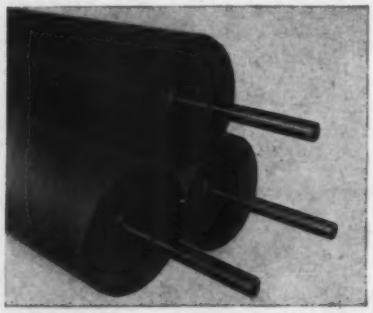


Made in 12 sizes for single passage operation and in 15 sizes for continuous circulation, the capacity of single passage units ranges from 2 to 70 gallons per hour; of the units for continuous circulation, based on operating pressure of 50 lb. and SAE No. 30 oil at 150 Fahr., from 15 to 130 gallons per hour.

Used for purification of oils lubricating turbine and hydroelectric generators, the manufacturer suggests the use of the purifier for removing acids, sludges, abrasives, and other forms of contamination from lubricating oil contained within forced feed lubricating systems applied to pulp and paper mill processing equipment.

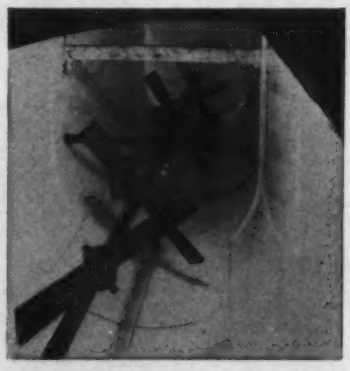
Lightweight Wood Stave Roll

Rodney Hunt Machine Co., Orange, Mass., has announced a lightweight wood roll of improved construction to meet special industrial requirements. In this design of roll, a series of wood heads are anchored to the through shaft by means of the patented Rodney Hunt Shaf-tite construction. The roll is supplied in most any diameter from 12 in. and up.



Glass Tanks

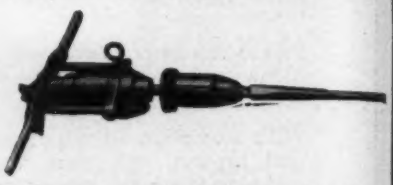
The Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, Pa., has announced a line of glass tanks for applications requiring a non-corrosive shock resisting material. Some of the features of this line, according to the announcement, are the following: The tank material, because of a new method of heat treating, has a physical strength four to five times greater than ordinary glass. It has a high resistance to thermal shock; also it will withstand continuous operating temperatures of 650 Fahr. and an instantaneous thermal shock of 400 to 500 degrees.



Usually, a tank is surrounded by a wooden framework filled with compound to protect it against severe physical blows and as an insurance against leaks.

Cleaner for Small Tubes

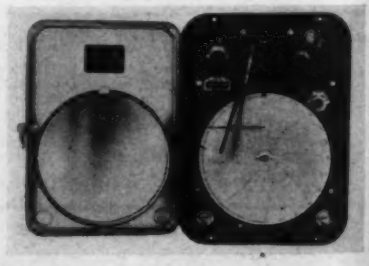
A tube cleaner, especially designed to clean small diameter tubes (⅜ in. to 1¼ in. ID) used in condensers, heat exchangers, and similar apparatus, has been announced by Thomas C. Wilson, Inc., 21-11-44th Ave., Long Island City, N. Y. The cleaner operates at high speed. It uses a cutter-bit which, according to the manufacturer, will not clog or jam so as to damage or break either the shaft or the cutter-bit itself. The manufacturer also states that, with this cleaner, entire bundles of tubes can be cleaned in a very short time, and that frequently it is unnecessary to remove the tube bundles from the shell.



An attachment has been designed to give the combined movement of a rotary tube cleaner and a percussion hammer to the cutter-bit. This attachment assists the cutter-bit to obtain a bite on the deposit and to break up the hardest deposit. Operated by the air or steam used as the scavenging agent in the tube cleaner, the attachment is recommended by the manufacturer for use with the tube cleaner in cleaning either partially or totally plugged tubes in which an especially hard deposit is encountered.

New Air-Operated Controller

A new air-operated automatic control instrument, known as *Convertible Free-Vane Controller*, has been announced by



The Bristol Company, Waterbury, Conn. The new instrument, which can be converted from one type of control system to another, is made for automatically controlling temperature (up to 3600 Fahr.), flow, liquid level, pressure, *p*H value, time program, etc. It is offered in the following types: Monoset (On and Off), Ampliset (Throttling), Preset, Reset, and Magniset.

Line of Boiler Feed Systems Expanded

Johnson Corp., Three Rivers, Mich., has expanded its line of boiler feed systems by the addition of a larger size of the pumping unit, systems now being available for

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CONTINUOUS ROTARY VACUUM FILTERS, including:

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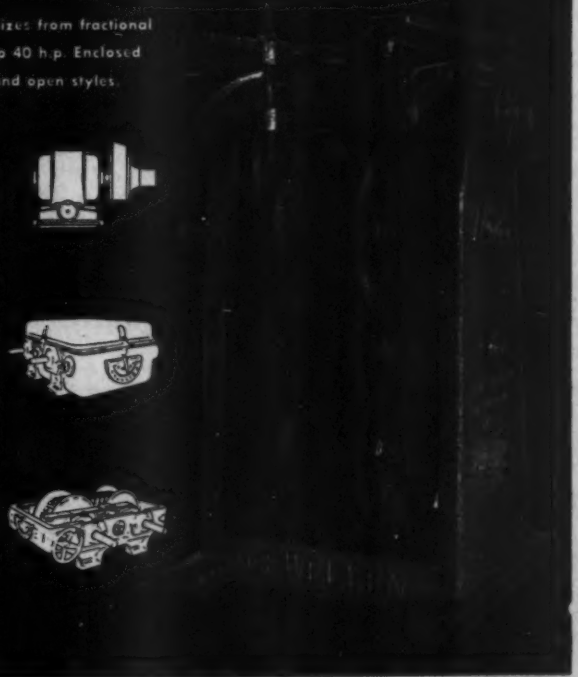

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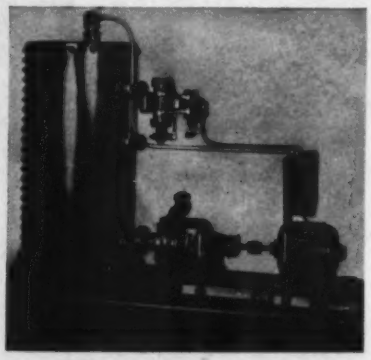
use with boilers from 30 hp. to 500 hp., operating at pressures up to 150 lb. In the Johnson system, boiler pressure is admitted to an equalizing chamber behind the pump during operating cycles, and the equalizing chamber is vented to a condensate receiver. Motionless metal electrodes are placed at the boiler water line to signal the pump



whenever the boiler needs water. Automatic vent on condensate receiver disposes of air and non-condensable gases picked up by the system. Auxiliary water level control in receiver adds make-up water to the system whenever necessary.

The manufacturer claims a saving of as much as 60 per cent in power pumping cost, and direct fuel savings of 10 to 15 per cent.

Floor Stand Hoists for Screw Stem Gates

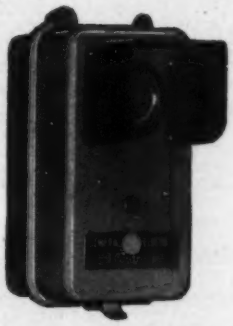
Rodney Hunt Machine Co., Orange, Mass., has designed a new line of floor stand hoists for screw stem gates such as are used on reservoirs, canals, and other

water controlling projects. They include the use of hardened gears, efficient seals, and anti-friction bearings. Handles are removable. The stands have selective two-speed gear ratios. They permit the gates to be stopped and held at any stage of opening.

Outdoor Photoelectric Relay

A general-purpose photoelectric relay for outdoor applications requiring rapid and accurate counting, controlling, sorting, or limiting operations has ben announced by the Electronic Control Section, General Electric Co., Schenectady, N. Y. The relay is designated as *Type CR 7505-K 108*. Its contacts control 2 amperes at 115 volts, 25 to 60 cycles, alternating current, or 0.5 ampere at 115 volts, direct current.

In addition to a Type GL-930 phototube, the relay contains a Type GE-117 P7GT pliotron tube. The filament of this amplifier tube operates on full line voltage. The tube also incorporates a diode rectifier which functions when a-c. power supply is used.



The relay's weatherproof case is equipped with a sun shield, and a directional lens system to minimize the effect of slanting sun rays. In addition, the lens system increases the relay's sensitivity.

The relay can be mounted in any position and can be adjusted under actual operating conditions, without removing the cover. The chassis can be removed from the case for inspection or servicing, or, if desired, for mounting with other apparatus in a combination enclosure.

Sweat Band

Aldine Paper Co., 373 Fourth Ave., New York City has announced a newly-developed forehead sweat band for keeping perspiration from running into the eyes of workers. The outside covering of the band, according to the announcement, assures silky-cool,

nonirritating, forehead contact. A cellulose fiber filler within the band absorbs the perspiration. Maintaining its shape even when completely saturated, the band, which fits any size head, is stated to be rugged enough for rinsing, drying and re-use.

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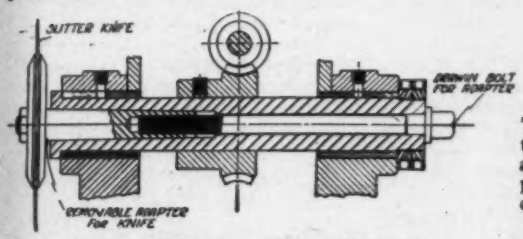

Knife Spindle Assembly of No. 450A

The spindle construction of No. 450A insures accurate alignment and permits quick, easy change of knives.

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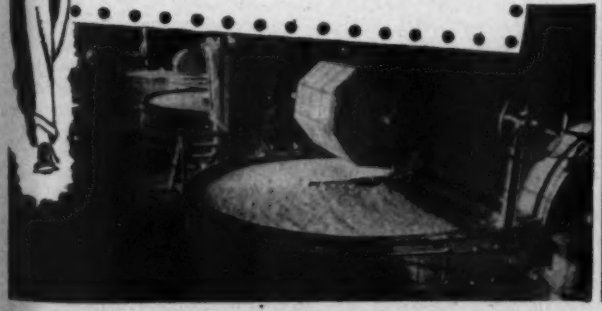

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Beater Practice in Manufacture of Offset Papers

This is an experimental study carried out at the Bureau of Standards, in which 73 experimental papers were made to determine the relationship between mechanical beating of the fibers and properties of the offset papers made from them.

Previous work gave data on papers made from wood fibers, whereas the present article furnishes data on ragstock and on papers containing a mixture of rag and wood fibers. The rag fibers showed differences in their response to beating from the effects noted in the case of wood fibers. Old rags withstood the long beating period requisite for the development of maximum strength and good sheet formation, without showing the adverse effects noted with wood fibers. All papers from rag stock showed much lower expansivity than did wood fiber papers of corresponding strength.

A mixture of equal parts of old rags with strong sulphite pulp gave papers whose folding endurance approached the average of the two pulps. On the other hand papers made from sulphite, mixed with wood-filler fiber pulp, showed folding endurances that were only slightly above those of the weaker pulp. Clay fillers added to sulphite stock lowered the expansivity in the machine but not appreciably in the cross direction. C. G. Weber, Merle B. Shaw, and M. O'Leary. J. Res. Nat'l Bureau of Standards 30, No. 4, 267-79 (April 1943).

Ultraviolet Light, Its Action on Cellulose and Protein Sizes

Ultraviolet light acting on cellulose forms water and carbon dioxide. Catalysts accelerate the reaction. Since ozone is formed, its action was studied. The increase in copper number appeared to be the greatest when a temperature of 40 deg. and a moisture content of 45-55% obtained. The various wave lengths of ultraviolet light were also investigated. Ultraviolet light may be used to destroy microorganisms, especially molds and putrefying bacteria in old manuscripts. When ultraviolet light with wave lengths of 3500 to 3050 Angstrom units were used, bleaching was accelerated. Ultraviolet light appeared to cause an increase in the viscosity of cellulose nitrate and a decrease in the solubility in alcohol-ether. Denitration is caused, and in the presence of suitable softening agents, there is marked yellowing. Malachite green filters made from cellulose nitrates cannot be used, since oxides of nitrogen are liberated and the dye decomposes. Cellulose acetates are also unstable, but ethyl acetate seems to be more satisfactory.

Cellulose in the form of cellophane permits the passage of ultraviolet light. The following cellulosic films are listed in decreasing order of transparency to ultraviolet light: cellophane, acetates, nitrates, ethylcellulose, and benzylcellulose. This transparency decreases on long exposure to ultraviolet light. Paper is treated with ultraviolet light (besides destruction of microorganisms) to induce the polymerization of impregnating materials and, in certain experiments, to cause an accelerated aging of the paper. When sized with gelatin, paper deteriorated rapidly under irradiation, and brown specks resulted. When exposed to ultraviolet light, aqueous solutions of gelatin decomposed, without, however, losing all the characteristic protein reactions. The general conclusion is reached that the harmful action of ultraviolet light on glue-sized papers depends on the action primarily on the gelatin. M. de Buccar. Papeterie, 63, 49-58, 177-8, (1941) through Chem. Zentr. 113, I, 132, and 2346 (1942).

Sodium Chlorite as Pulping Agent

This chemical is applicable to rye straw, esparto, potato stalks, and to other annual crops, provided alkaline pre- or post-treatments are also used, or when a suitable acid medium is resorted to. In the latter case, adequate buffering prevents extensive hydrolysis. The pulps are pale yellow or white, and the yields are at least 10% higher than those obtained by other processes, and the materials show relatively little degradation. Excepting in the case of potato stalks, the alpha-cellulose content is usually below 80% and the hemicellulose content is above 20%. Although the pre- and post-treatments with alkali lead to chlorite pulps that are non-uniform, the products are quite well suited to papermaking. On short beating, a parchmentized paper is formed, but these sheets have a high folding endurance and their strength tests compare favorably with those on well bleached wood pulp. Normally, the breaking length was above 8,000 meters.

Chlorite pulping does not involve pressure cooking, and usually temperatures of 40-70 deg. suffice. While the alpha-cellulose content is low, it may be increased to 92-95% by suitable means. The experiments described are orientating rather than final and do not furnish data giving the optimum conditions. Besides rye, esparto, and potato stalks, on which most data are given, the following were also examined: cornstalks, reeds, sunflower stems, rape stalks, and tobacco plants. In general, the degree of polymerization of the pulps was high. The yields however were often quite low, which is ascribed to early harvesting and to the presence of leaves in the material subjected to chlorite treatment. All products were reasonably white and were potential papermaking materials. A. W. Sohn and F. Reiff. Papier-Fabr. 40, No. 27/28 105 (1942); through Tech. Bull. Papermakers Assn. Gt. Britain & Ireland 19, No. 7-9, 33 (1942).

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Also wanted—Hydrapulper suitable for handling 100 tons of mixed papers per 24 hours.

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1 No. 4-A or No. 5-A Bird Saveall.

1 perforated roll similar to type of roll used with Voith Inlet Roll, to be 5 inches diameter and 72 to 76 inches long, with 10 or 12 inch journals.

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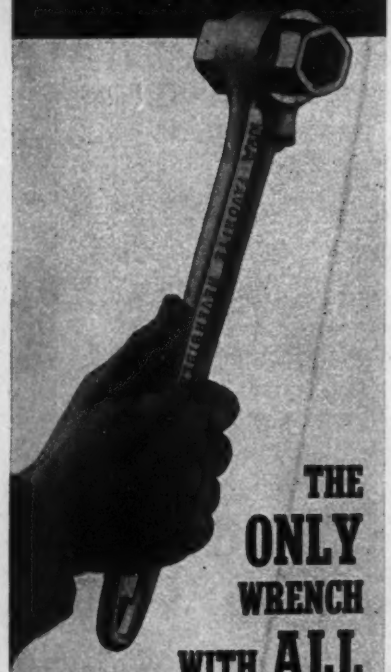

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PAPERMAKING PATENTS

IN THE UNITED STATES — Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Paper Having High Wet Strength and Process of Producing the Same

Patent No. 2,291,079. Raymond P. Hofferbert, Stamford, Conn., assignor to American Cyanamid Company, New York, N. Y., a corporation of Maine. No Drawing. Original application February 6, 1940. Serial No. 317,527. Divided and this application February 6, 1940. Serial No. 317,526. 2 Claims. (Cl. 117—155). A process of increasing the wet strength of paper which comprises treating paper with an aqueous solution of a melamine-formaldehyde condensation product, adjusting the melamine-formaldehyde condensation product content so that the proportion of the condensation product is about 0.5—3% of the weight of the paper (dry basis) and polymerizing said condensation product.

Process of Reclaiming Wax from Waste Waxed Paper

Patent No. 2,298,943. Perlie E. Howard, Nashua, N. H. No drawing. Application May 15, 1939. Serial No. 273,709. 2 Claims. (Cl. 196—17). The process of reclaiming in substantially its original pure condition substantially all of the wax present in waste waxed paper stock without removal of printers' ink from the stock if printed and without impairing the original quality of the paper stock fibres for reuse, said process comprising coarsely shredding the paper to provide relatively uniform sized pieces generally ranging from one-quarter to three-quarters of an inch square, immersing the shredded paper in a bath of dewaxing liquid and retaining the paper sufficiently below the top of the bath to provide a relatively quiet wax collecting zone at the top of the bath above the immersed paper, said bath consisting essentially of water and bicarbonate of soda in the proportion of approximately two ounces of bicarbonate of soda to one gallon of water, the shredded paper being in the proportion of not to exceed approximately one pound of paper stock, dry weight, to two gallons of the dewaxing compound, subjecting the mass to indirect heat to attain a temperature sufficient to melt the wax but not to exceed 205° F., causing the wax to melt, intermittently agitating the mass after coming to temperature to free the melted wax and to cause it to rise through the shredded paper into said zone and removing the separated wax from said zone.

Fourdrinier Machine

Patent No. 2,299,746. Harry H. Hart, Kennett Square, Pa., assignor to The Pusey and Jones Corporation, Wilmington, Del., a corporation of Delaware. Application October 12, 1939. Serial No. 299,195. 21 Claims. (Cl. 92—44). A Fourdrinier machine having an endless wire forming screen and a structure normally enclosed within the wire loop, including a breast roll, table section, and couch roll, comprising supports for the structure and means for applying the screen around said structure, said means including a unitary and longitudinally and transversely rigid wire support over which the entire loop is draped, said first named supports being adapted to permit relative lateral movement between the wire loop and the structure whereby said unitary support and the loop draped thereon may be moved laterally to enclose the structure within the loop.

Coated Chart Paper and Method of Making Same

Patent No. 2,296,972. Earl C. Alkire and Emil F. Blase, Springfield, Ill., assignors to Sangamo Electric Company, Springfield, Ill., a corporation of Illinois. Application April 22, 1940. Serial No. 330,880. 11 Claims. (Cl. 117—21). In the method of making coated chart paper the steps which comprise: passing a sheet of paper through melted carnauba wax to apply a coating of wax thereto, treating the wax coating with a carbon tetrachloride solvent, evaporating the solvent from the wax coated sheet to dry and crystallize the wax surface, polishing the wax coating, passing the sheet through a liquid dispersion of a finely divided pigment, and drying said sheet to remove the dispersion medium and leave a finely divided pigment coating on the polished wax coating.

Method of Treating Lignocellulosic Material and Product Produced Thereby

Patent No. 2,292,389. John G. Meiler, Wausau, Wis., assignor to Marathon Paper Mills Company, Rothschild, Wis., a corporation of Wisconsin. No Drawing. Application November 14, 1941. Serial No. 419,212. 8 Claims. (Cl. 106—123). The process of treating a lignocellulose material for producing a product capable of being molded under heat and pressure in the presence of a plasticizer to form a product having a high wet and dry strength and of low water absorption which comprises digesting lignocellulose material under an elevated temperature and pressure with an alkaline aqueous solution containing a predetermined amount of an alkaline material sufficient to be neutralized by the acids developed during digestion and to permit of the attainment of a pH between about 4.0 and 6.5 in the digesting material for a relatively long portion of the total digestion time with a final pH not below about 4.0, the amount of the alkaline material being such that it is completely neutralized by the acids developed during digestion in a relatively short portion of the digestion time, and washing and drying the digested material.

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Brown Instrument Co., Philadelphia—This company has just issued a new bulletin (87-1) entitled, "Brown New-Matic Time-Pattern Controller." The bulletin describes in detail the operating principle of the two-unit time-pattern controller: (1) the pattern transmitter and (2) the control instrument. It also contains diagrams and illustrations of installations and a section devoted to a description of applications of the controller to manufacturing processes. Copies are available.

DeLaval Steam Turbine Co., Trenton, N. J.—This company is now making available to anyone interested reprint copies of an article entitled, "Adapting an Auxiliary Turbine for Higher Pressure," by R. G. Baker, of DeLaval. The article appeared in the March, 1943 issue of *Power*.

Division of Labor Standards, U. S. Dept. of Labor, Washington, D. C.—Special bulletin No. 11, "A Guide to the Prevention of Weight-Lifting Injuries," has just been published. The information contained in this bulletin was gathered by a group of safety experts, plant physicians, and personnel officers who were called together last winter by the U. S. Department of Labor's Division of Labor Standards to consider practical methods for preventing injury to workers engaged in the handling of heavy weights.

Goetzel Gasket & Packing Co., Inc., New Brunswick, N. J.—A new series of technical bulletins is being prepared by this company, the first of the series having just been released. This bulletin describes the research laboratory and method of testing used in determining hitherto unknown factors in gasket engineering, and succeeding issues will treat the study of each gasket type individually. Photomicrographic illustrations, graphs, and tables are also included as reference material. Anyone interested may receive these bulletins regularly by making their request on company letterhead, mentioning their title.

Jeffrey Mfg. Co., Columbus, O.—Catalogue 750 on "Electric Vibrating Equipment" has recently been released by Jeffrey Manufacturing Company. This 176-page book covers the company's complete line of electric vibrating equipment for solving many materials handling and processing operations in all industries. The book also contains many illustrations and diagrams.

Walter Kidde & Co., Inc., New York City—This company, makers of fire-extinguishing apparatus and systems, has issued an illustrated 16-page manual entitled, "How to Teach Fire Fighting." It is designed to aid factory executives in instructing employees in fire-extinguishing techniques. It gives the classification of various types of fires, the kind of extinguisher best suited to each, and the methods of setting up demonstrations in order to teach the proper use of each type of extinguisher. Copies are available from the company.

Link-Belt Co., Chicago—"A Message from the Women Soldiers of the Production Front" is the name of a new 12-page illustrated book, No. 1950, released by Link-Belt Ordnance Company. It contains the interesting speeches of 4 women workers who were selected by women coworkers in the welding, machine shop, small-tools, and assembly departments, as delegates to represent them at a monthly meeting of the plant supervisory group. Copies are available.

R-S Products Corp., Wayne Junction, Philadelphia—This company has recently prepared a 4-page illustrated bulletin No. 16-B containing complete dimension tables for butterfly valves, 15 to 125 psi. Valves for regulation and shut-off duty for air, gas, steam, liquids, and semi-solids—manual and automatic control—are all featured.

Wheelco Instruments Co., Chicago—This company has announced as available to anyone interested Bulletin No. Z6200, a condensed listing of the principal items of equipment manufactured by them. Due to space limitations, the instruments are, of course, described very briefly; however, individual bulletins providing detailed information on specific instruments are available.

Books

1943 Packaging Catalog—This book, published months later than in peace years, is a review of a year and a half of packaging goods for war and under wartime conditions. The new volume features illustrations of the many ingenious packages developed to pack munitions, soldiers' and sailors' rations, ordnance, and civilian supplies. It is compiled from firsthand information gathered in hundreds of packing plants and on the fighting fronts. The book is made up of 633 pages, size 9x12 inches, and has a stiff leatherette cover. There are fourteen sections on all phases of packaging, but the first section entitled, "Package Planning in Wartime," is the keynote to the entire work. There are several valuable charts, one of which is the chart prepared by the editors of the *Packaging Catalog* on the properties of packaging materials. This chart lists tensile strengths, tear resistance, chemical qualities, and many other essential properties of all materials used in packaging. Price of the book is $2.50. Orders should be addressed to the Packaging Catalog Corporation, 122 East 42nd Street, New York 17, N. Y.

Association Reports

All of the orders which affect the industry emanate from the OPA and WPB and clear through the office of E. W. Tinker, executive secretary of the American Paper and Pulp Association. Copies of all government orders are sent by the Association to members. Listed below are releases sent out during June by the APPA. Any correspondence with that office regarding these releases should carry identifying titles and numbers as listed.

Federal Regulations

Labor—Wage and Salary Stabilization No. 2—General orders 5, 6, 9, and 31.

Labor—War Manpower Commission No. 19—Essential activities—Commission has not only declared pulpwood cutting operations as an essential activity, but has defined a general policy relating to essential activities. Specific application of this general policy is left in a large part to local determination.

Materials and Supplies No. 20—Priorities Regulation No. 3 (amended).

Materials and Supplies No. 21—Casein, Amendment 16, M.P.R. 289.

Materials and Supplies No. 22—M-333—Tapioca Flour.

Materials and Supplies No. 23—Revised form of M-93 which gives control of all wood pulp both allocation and end-uses to the WPB.

Paper Production No. 15—L-239—Folding and Set-up Boxes.

Prices No. 6—M.P.R.-114 (Amendment 7).

Pulpwood Production No. 6—Pulpwood (Maryland, West Virginia, Pennsylvania, and Ohio) T.M.P.R.-32.

Pulpwood Production No. 7—Pulpwood in Southeastern States—M.P.R.-388, Amendment 1.

Pulpwood Production No. 8—M.P.R.-410—R.M.P.R. 387.

Labor Relations

General No. 2—Prospective Pulpwood Labor.

General No. 3—Prospective Pulpwood Labor (Refer to General No. 2).

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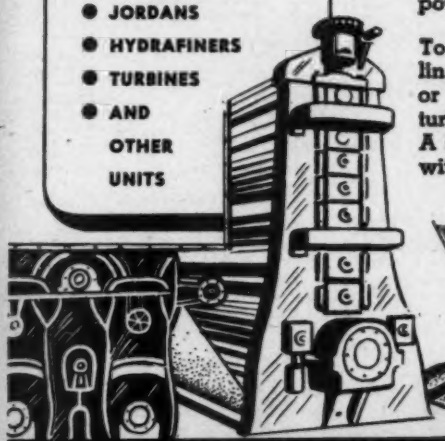
- TURBINES
- AND OTHER UNITS



Paper mills . . . steel mills . . . electric generating plants . . . or wherever unfailing, day-in, day-out service is demanded, you'll usually find a Bowser Oiling system in service. In paper production, Bowser has been the accepted standard of efficiency for many years . . . serving many types of mills . . . helping to break world's production records . . . providing dependable lubrication to save machines, power and time.

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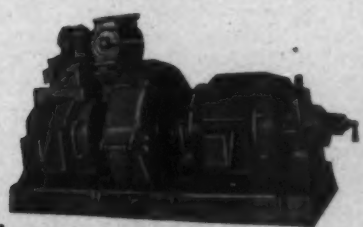

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- **New equipment is available when essential to National welfare.**

THE BAUER BROS. CO.,
SPRINGFIELD, OHIO

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS — *per cwt.*

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Headings	-7.25
White Shrunk	-5.00
Siesias No. 1	-5.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-5.00
White	-14.00
Gray	-14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS — *per cwt.*

New Dark Cuttings
New Mixed Cuttings
New Light Silesias
Light Flannelettes — Nominal
Unbleached Cuttings
New White Cuttings
New Light Oxfords
New Light Prints

RAGS (Foreign)

ex dock New York City

OLD RAGS — *per cwt.*

No. 1 White Linens
No. 2 White Linens
No. 3 White Linens
No. 4 White Linens
No. 1 White Cottons
No. 2 White Cottons
No. 3 White Cottons
No. 4 White Cottons
Extra Light Prints
Ord. Light Prints — Nominal
Med. Light Prints
Dutch Blue Cottons
French Blue Cottons
French Blue Linens
Checks and Blues
Linsey Garments
Dark Cottons
Old Shoppers

ROPE and BAGGING

f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	4.00 to 4.25
Wool Tares—	
Light	3.75 to 4.00
Heavy	4.00 to 4.25
No. 1 Scrap Bagging	3.50 to 3.75
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*85.00
New Burlap Cuttings	5.75 to 6.25
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft Jute	5.00 to 5.25
Mixed	1.25 to 1.50

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment, with brokers' allowance of 4 to 9 per cent.

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, Unruled	57.50-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	32.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Magazines	33.50-
Mixed Books	17.00-
Ledger Stock—	
No. 1 White	42.50-
No. 1 Mixed (Colored)	37.50-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	37.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Oversize	17.00-
No. 1 Baled	15.00-
Old 100% Kraft Corrugated Containers	35.00
Old Corrugated Containers	23.00
New Corrugated Cuts	15.00-
Mill Wrappers	17.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	14.00-

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	6.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	24.00 to 24.75
80-100 mesh (bags), lb.	—
Argentine, lb.	—
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	12.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicia), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	4.01-
F	4.03-
G	4.14-
WW	4.84-
Rosin (Wood), carlots	3.25-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock—	
(Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.30-
Paper (Sp.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	18.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.5.60 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo.:

Bleached softwood sulphite	76.00
Unbleached softwood sulphite	66.00
Bleached hardwood sulphite	73.50
Unbleached hardwood sulphite	63.50
Bleached Mitscherlich sulphite	81.00
Unbleached Mitscherlich sulphite	72.00
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Standard news print siderurus	46.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda pulp	66.00
Unbleached soda pulp	62.00
Ground wood pulp	46.00
Sulphite screenings	38.50
Sulphate screenings	38.00
Ground wood screenings	30.00
Northern unbleached sulphate siderurus	73.00
Southern unbleached sulphate siderurus	63.50

PAPER

f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	45.00-
Chip, agl. mla. lined	60.00-
Coated, white patent	
.016	80.00-
.020 and heavier	75.00-
Kraft liner	62.00-
News	45.00-

	per cwt.
Book (cased)	
No. 1 Coated	15.50-
No. 2 Coated	14.00-
No. 3 Coated	12.25-
No. 4 Coated	12.75-
No. 3 Offset	11.00-
A Grade Super	10.75-
B Grade Super	10.25-
Bonds (Rag Content)—	
100% Rag	*per cwt.*
Ext. No. 1	42.50 to 48.00
100% Rag	35.00 to 37.75
85% Rag	
75% Rag	25.00 to 27.00
65% Rag	
50% Rag	20.80 to 22.75
25% Rag	18.50 to 20.00
Regular Colors	1.00 cwt. extra
Bonds (Sulphite)—	*per cwt.*
No. 1	11.70-
No. 2	10.75-
No. 4	9.90-
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	*per cwt.*
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50
Ledgers (Rag Content)—	
100% Rag	*per cwt.*
Ext. No. 1	41.40 to 48.50
100% Rag	36.25 to 39.25
85% Rag	32.20 to 37.75
75% Rag	26.25 to 28.00
65% Rag	22.80 to 27.75
50% Rag	22.10 to 24.25
25% Rag	19.50 to 21.50
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)—	*per cwt.*
No. 1	13.00-
No. 2	12.05-
No. 4	11.20-
News—	*per ton*
Rolls (Contract)	54.00-
Rolls (Spot)	(nominal)
Sheets	62.00-
Tissues (Carlots)—	*per ream*
White, No. 1	1.12½ to 1.20
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12¼ lb. to M shts.) per ea.	.60-
Napkins, full crepe and emb'sed (12¼ lb. to M shts.) per ea.	.00-
Toilet, Bleached (M shts.) per ea.	5.65-
Toilet, Unbleached (M shts.) per ea.	4.25-
Towels—	*per ream*
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05
Wrappings (Kraft)—	*per cwt.*
Extra Quality	6.00-
Super-Standard	5.25-
No. 1 Wrapping	5.00-
Standard Wrapping	4.75-
Standard Bag	4.37½-
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached papers—	
M.F. & M.G. Waxing, 30 lb. (Carloads only)	*per cwt.* 7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.25
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd reammarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-30 lb.	6.75 to 7.00

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---

bombs

and printers' ink

Both of them are fighting the Axis and winning the war. When the fight is won the bombs will have served their purpose but printers' ink will loom large in the post-war era.

We are going to have new and better aniline and rotogravure presses for post-war industrial printing.

Just now we are building machines for propelling bullets into the heart of the Axis. Tomorrow we'll build printing presses for you and your customers' needs.

In the meantime, send us some idea of your post-war plans and requirements that you have in mind.

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How to Get Better Process Water

You Can Get BETTER WATER And Produce A Better Sheet By Using NORWOOD FILTERS

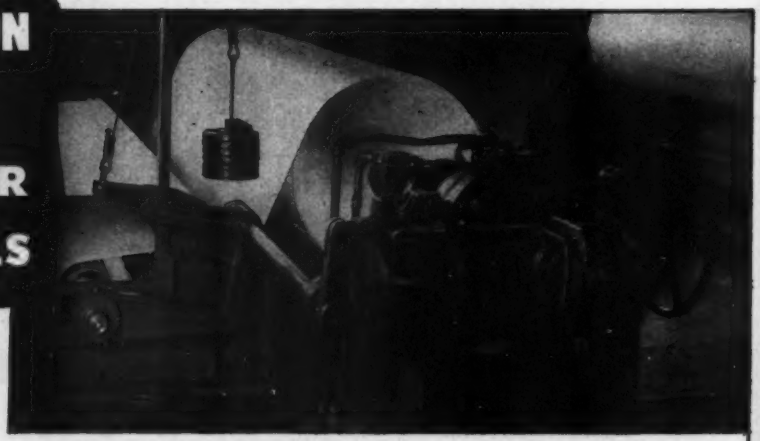
YOU can get better process water which will help you produce a better sheet . . . free from spots and specks, and of more uniform color . . . by using Norwood Filters. Norwood engineers have been working with paper mill men on their process water problems for half a century. Norwood Filters . . . designed and built on the basis of this long experience . . . have all the important features which give long, satisfactory operation with a minimum of attention and at low operating costs. Investigate Norwood Filters now.

Shipments can't be made "as usual", but we will gladly discuss just what can be done to keep your filters running or bring them up to date. Write us about your process water problems today.

Get a Good Start And a Good Finish With
NORWOOD
WATER FILTERS AND PAPER FINISHING MACHINERY

The Norwood Engineering Company
16 No. Maple St., Florence, Mass.

CONSTANT TENSION UNWIND ASSURES BETTER REWOUND ROLLS



Cameron Constant Tension Unwind Stands are used at the feed end of roll processing machines such as slitters, winders, coaters and printing presses.

The purpose of this equipment is to maintain a constant tension on the web from the start to the finish of the run regardless of speed changes of the processing machine to which it is attached or of the steadily decreasing diameter of the original roll.

The use of a Cameron Constant Tension Unwind Stand results in rewound rolls of uniform density from the core out, less breaks in rewinding, better starts and in the case of multi-color printing, a marked improvement in lengthwise register.

The Unwind Stand illustrated is type "C" equipped with water-cooled mill roll brakes for high speed operation. Two heavier types, "D" and "E," are built for use with wide, faster running winders also two lighter types "A" and "B." Type A is equipped with air-cooled brakes on the mill roll.

Write for further details today on proper tension for your needs.

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61 POPLAR STREET, BROOKLYN, N. Y. • MIDWEST OFFICE: 111 WEST MONROE STREET, CHICAGO

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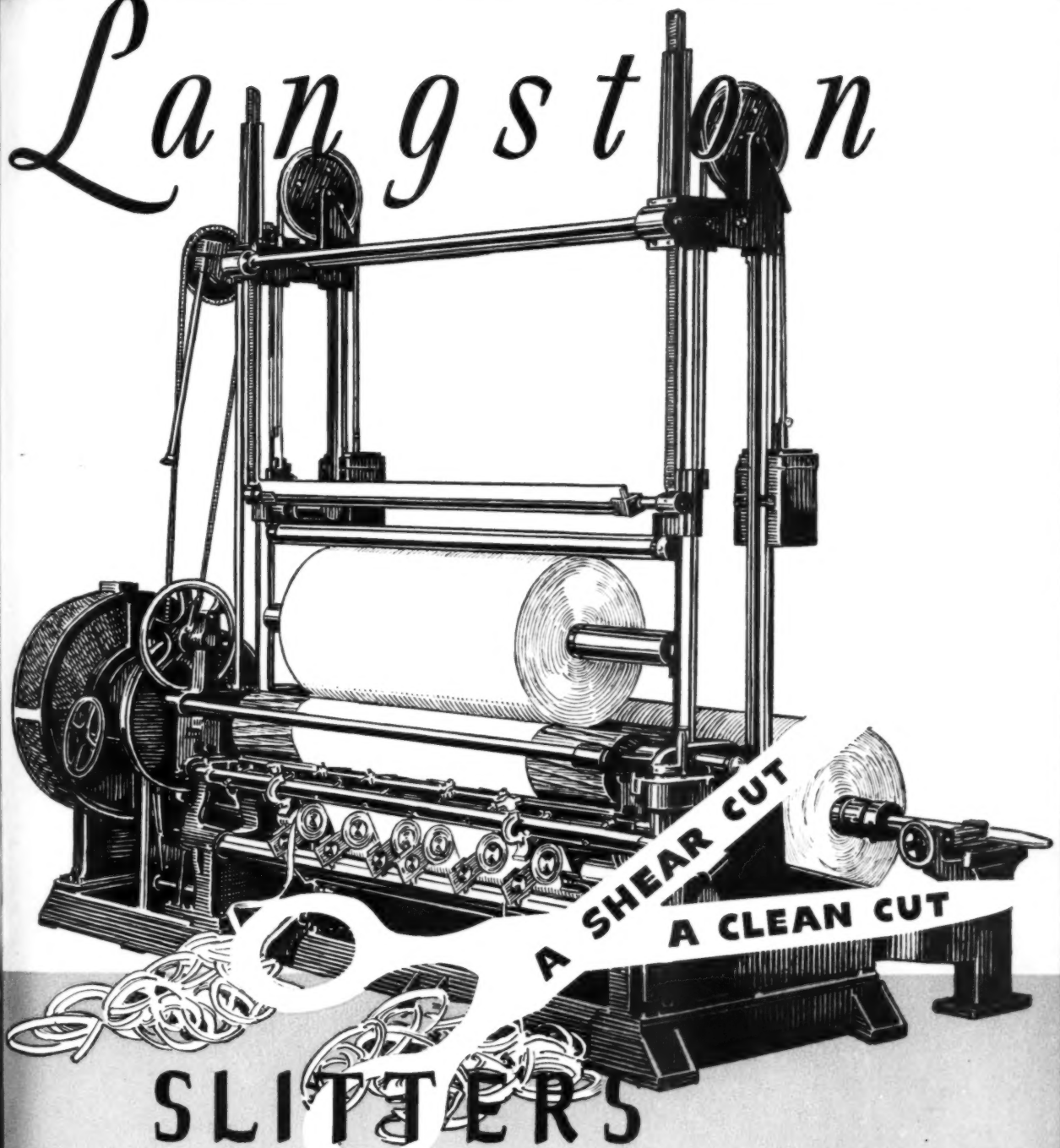

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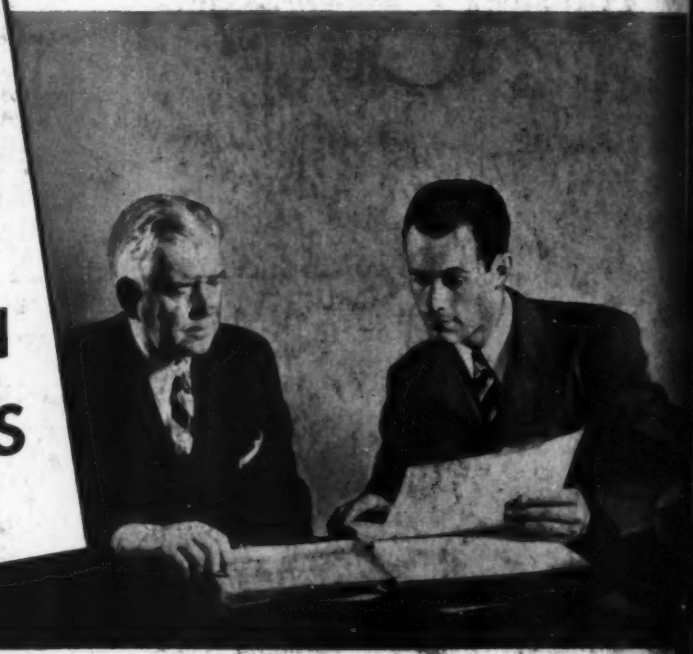

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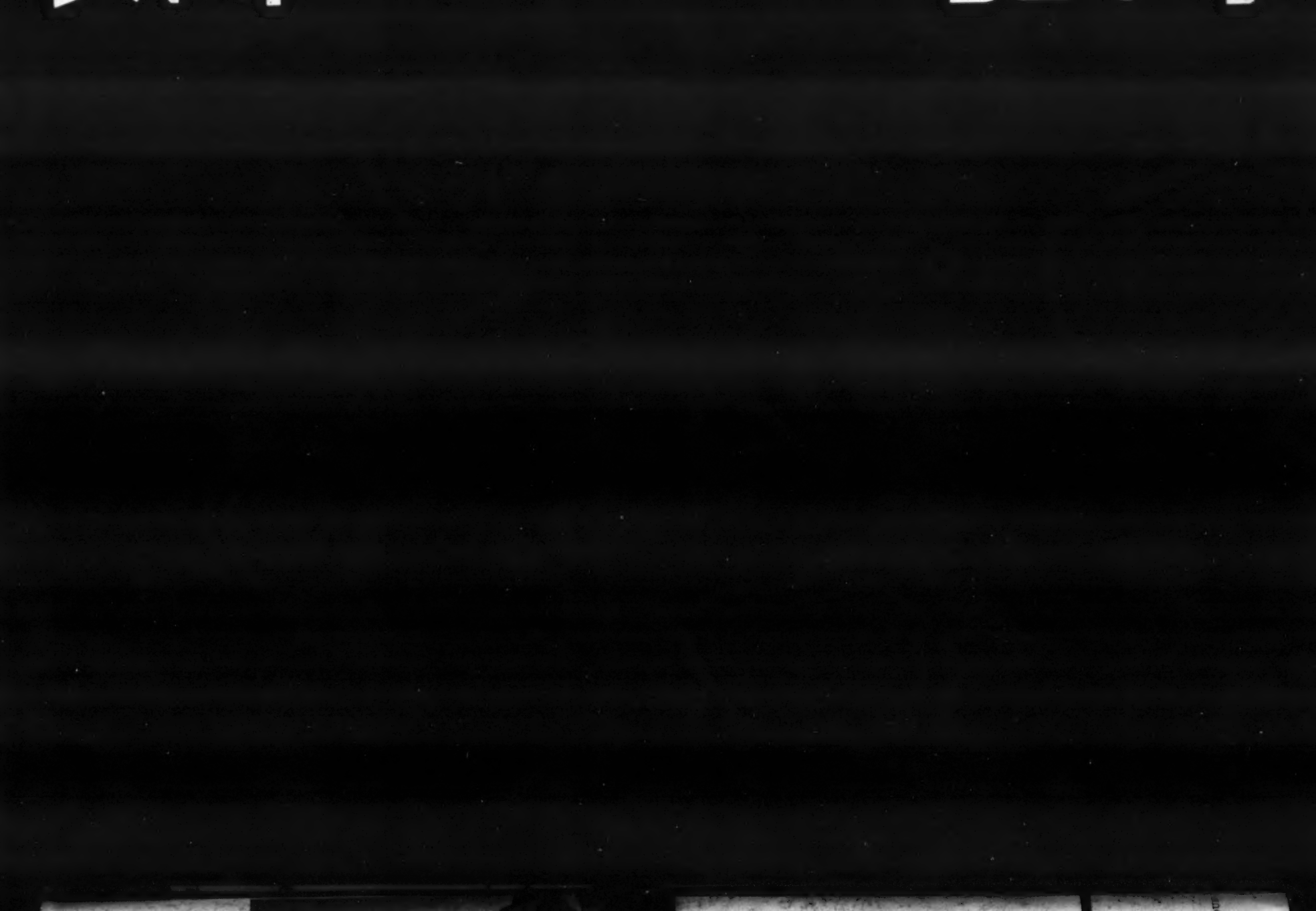
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